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## ORIGINAL ARTICLES.

### A TEST OF CONDITION: PRELIMINARY REPORT.

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**Introduction.**—This report is given to the medical profession in its preliminary stage, after the work of a year and a half; so that it may become immediately available for use and perhaps the earlier subject to modification and improvement. The importance of the principle involved, however, cannot be overestimated.

**Importance.**—There does not exist to-day a reliable test of condition, although its need is felt in very many quarters. The physician would be glad to know accurately what the real condition or relative degree of health is in the patient who comes under his care for the first time. It is of the utmost importance for him to know to what extent the trouble complained of affects the general health and vitality. It would give him a real guide on which to base his advice to the overworked or run-down in prescribing a treatment of tonic, rest or exercise. It would give him a real method of determining the increase of health resulting from such treatment. "Feelings," cannot always be relied upon. To the prospective employer, military, civic or mercantile, the condition of the applicant, if accurately determined, would be of vital importance. To the psychologist an accurate test of this sort would serve as a basis for definite comparisons between mental and physical efficiency, at present almost an impossibility due to the meager information of physical condition obtainable by the tests now in use. To the educational expert it would give a basis for determining the effect of the various hygienic or unhygienic features of our modern school curriculum. To the physical trainer, the worker in practical hygiene, it would give a means of noting actual progress in the most important part of his work and of measuring his success in producing the condition of health. To the athletic instructor, the coach, the oarsman and the prize-fighter it would furnish what had long been sought, an indication of success of methods of training.

During the course of an investigation on the effects of muscular contraction on blood pressure the writer elaborated a test that promises to be useful in the way indicated. In brief, the test consists in the comparison of the systolic blood pressure and the heart rate of the recumbent position with those of the standing position. The physiology involved is as follows:

On assuming a standing position the voluminous splanchnic veins are constricted by the vaso-motor action of the splanchnic nerves. If this

contraction is effective against the increased pressure brought to bear through the gravity, the blood pressure in the upper body rises. If it is ineffective, it fails to rise or actually falls. This accounts for the great disparity of opinion on this point, some observers finding a regular rise of 10 to 15 mm., others finding no average change, others a fall, when the standing position is assumed after the recumbent. This is an indication therefore of the efficiency of the splanchnic vasomotor mechanism which is not only important but essential to life. Upon its successful working depends the blood pressure in the brain, on the maintenance of which depends not only consciousness but the working of every function of the body and even life itself.

This mechanism is the latest in the body to develop, appearing as it has only after man has taken to the erect position. It is very easily wearied by lack of sleep, by work and by any unhygienic proceedings in general; even the routine of our daily life exhausts it to a greater or less degree. The *total* abrogation of its functions leads to the accumulation of the blood in the abdomen, the exsanguination of the rest of the body, and death. It is a very fair presumption that the working of this most important function upon which depends blood pressure, the distribution of the blood, and the working of the brain will be an indication of the condition of the body as a whole and an index to its general efficiency.

Should this be so, we shall have arrived at the end of our investigation and it will only remain to observe the rise or fall of the systolic pressure to estimate the condition of the individual. Another factor, however, enters into consideration. When the blood pressure tends to fall, the heart rate is accelerated. This is associated with a rise in pressure which masks the inefficiency of the splanchnic contraction. This is apparently a conservative mechanism in the nature of a second defence against a fall of blood pressure. Clearly then we must take into account the amount of acceleration of the heart as well as the rise or fall of blood pressures when we estimate the amount of relative failure of the splanchnic contraction.

This state of affairs in our ideal "condition" would be, a maximal rise of blood pressure with no acceleration of the heart on standing, evidencing such a complete working of the splanchnic mechanism that the heart would not be called to help raise the blood pressure. When, however, we observe the same rise of pressure accompanied by the increase of heart rate we must infer a relative insufficiency of the splanchnic mechanism on account of the calling of the heart to help.

Hence a poorer condition. Similarly, we would not consider the splanchnic mechanism as failing so badly should the blood pressure fall alone as in case it should fall and the heart be considerably accelerated. The latter condition would demonstrate the falling of pressure in spite of the assistance of the heart, hence a greater degree of failure.

We may not perhaps with perfect accuracy be able to balance these two factors and determine how much a fall of 1 mm. in pressure signifies in terms of increase of heart beats a minute. We shall arrive approximately at the truth, however, if we assume that the respective limits of their total ranges coincide. We may then divide each total range into fractional parts each of equal significance and of balanced importance.

The total change of blood pressure in those who may be considered "in health," is from plus 10 to minus 10 mm. Hg. That of pulse rate is plus 5 to plus 35. We may divide our range into fifths and construct the following tentative scale, in which the letters constitute the index to the splanchnic efficiency:

Increase in Heart Rate:	+10	+5	0	-5	-10
5	A	B	C	D	E
12	B	C	D	E	F
20	C	D	E	F	G
28	D	E	F	G	H
35	E	F	G	H	I

Interpreting this scale, we would have with an increase of 10 mm., if occurring with only five increase of heart rate, the index A, the best possible condition if accompanied with an increase of 35, and index of E, etc.

By the term splanchnic circulation we should properly mean the arterial branches of the celiac axis, their branches and capillaries, with the radicles of the portal vein. This system is partly arterial and partly venous and it is to the venous portion that attention is to be called more particularly; the arterial portion and the capillaries present features very similar to like structures in other parts of the body whereas the venous portion presents features of extreme and novel importance. During the course of this work, however, when the splanchnic area is referred to, it will be understood that the portal vein and its radicles are meant particularly.

*The Capacity of the Splanchnic Area.*—The veins of the splanchnic area share with other veins of the body (which are not supported by rigid structures) the features of collapsibility. On this account the blood content of the total splanchnic area may therefore be very great or very small, in fact the veins alone may, under certain conditions, contain nearly all the blood of the body. Hill and Barnard<sup>1</sup> found in the dog, in the vertical, feet down, position that the cutting of the cervical cord causes the pressure in the aorta to fall to zero and practically the whole of the blood to be collected in the splanchnic area. Squeezing the abdomen brought back the aortic pressure to the normal. Hill worked

with rabbits, suspending them without any operative interference in the vertical, feet down position; death invariably resulted in a short time. If the blood were kept from draining into the abdomen by a tight band, no inconvenience was suffered. If the rabbits were suspended in the head down position no bad result followed. These items serve to illustrate the great capacity of the splanchnic reservoir. The importance of this great capacity is demonstrated by the experiment of tying the aorta first below the celiac axis, and, secondly, above it, in an animal with the cervical cord cut. In the first instance practically no effect on aortic pressure is observed, in the second a very considerable rise is obtained.—Ludwig and Thiry.<sup>2</sup>

*The Control of the Capacity of the Splanchnic Area.*—Nervous.—(1) Splanchnic nerves, (2) vasomotor center, (3) reflex stimulation. Mechanical—(1) External pressure, (2) tone of abdominal walls, (3) aspiration of thorax, (4) respiration.

1. *Splanchnic Nerves.*—Mall<sup>3</sup> observed the direct influence of the splanchnics upon the portal vein. He obtained a contraction of the vein that could be easily noted by the eye. V. Besold and Gscheidlen<sup>4</sup> proved much earlier that the systemic veins had a vasomotor system and were controlled in a similar manner to the arteries. These investigations prove conclusively a somewhat neglected fact that the veins of the splanchnic area have a tone as well as the arteries. That the splanchnic nerves are in the main vasoconstrictor in their function is shown by the dilatation of the splanchnic vessels on section of the nerves. This dilatation may be measured with some accuracy by the variations in the aortic pressure. The greater the room made for the blood in the splanchnic area, the lower the pressure will fall.

Hill has given the result of the action of the splanchnics in the experiment already quoted. Ludwig and Cyon<sup>5</sup> found that section of one nerve caused a fall of aortic pressure of 30 to 50 mm., the section of the other 8 to 10 mm. more. In every case the section was made by lumbar incision so that the opening of the thorax and abdomen were avoided. Asp<sup>6</sup> found that after section of both these nerves tone was partly regained in about two weeks, showing a taking up of the function by other branches of the sympathetic system.

Bayliss and Starling<sup>7</sup> have found that the third to the eleventh anterior thoracic roots contain the fibers which affect the splanchnic area. By excising these roots they caused (1) an abrupt but ephemeral rise of pressure in the portal vein due to the constriction of the mesenteric arteries, (2) a fall, due to this same constriction, (3) a rise, due to the constriction of the hepatic branches of the portal vein.

According to Bever and v. Besold<sup>8</sup> section of the cervical or the upper dorsal cord does not produce any further material lowering of blood pres-

sure after the splanchnics have been cut. V. Besold<sup>10</sup> found that by stimulation of the peripheral end of the cut cervical cord he was able to send up the blood pressure to seven times its normal height. Work by Hill and Barnard (*op. cit.*) would seem to indicate that since the splanchnic area was robbed of the support of the abdominal walls paralyzed by the section of the cord and not affected by the cutting of the splanchnics, we would expect therefore a greater filling of the veins and a greater decrease of pressure, after section of the cord than after section of the splanchnics alone. One of their experiments shows that with the splanchnics cut the blood pressure fell considerably when the abdomen was subsequently opened by a crucial incision.

2. *Vasomotor Center*.—The vasomotor center has been located in the medulla oblongata. It can be excited in two ways (1) by variations in the central blood pressure, (2) by reflex stimulation. A fall in cerebral blood pressure, *i.e.*, cerebral anemia, will cause a stimulation of the center, a consequent vasoconstriction and a rise in pressure. A rise in cerebral pressure will cause the reverse.

There are subsidiary vasomotor centers in the spinal cord and even local centers outside the central system; on this account we may have local conditions of vasotone entirely independent of the general condition.

3. *Reflex Stimulation of the Splanchnic Area Through the Vasomotor Center*.—Any nerve, save the depressor nerve, when cut and the central end stimulated, will effect a stimulation of the vasomotor center and cause a rise in pressure. Some nerves, under certain conditions, are proven to carry depressor fibers and their stimulation will result in a fall of pressure. (Howell<sup>10</sup> Reid Hunt<sup>11</sup>) The depressor nerve when stimulated will cause a marked lowering of blood pressure and a decrease in heat rate, through its effect upon the medullary vasomotor center.

*Mechanical Factors*.—We have already noted that the mechanical squeezing of the abdomen will increase the blood pressure in rabbits and dogs, in the vertical feet-down position. The writer has called attention to the same effect obtaining in man in the sitting position when the knee is crossed and the abdomen compressed mechanically by the leaning over. It was found in a subject in poor condition that the blood pressure in the radial artery (held at the height of the ensiform) was greater when the abdomen was thus compressed than when the erect sitting attitude was assumed.<sup>12</sup>

Rowe<sup>13</sup> has noted quite empirically that long-continued study cannot be accomplished when "sitting up straight," and that the characteristic attitude of study—bending over at a desk or bending over with the knee supporting a book is conducive to the success of long-continued work. The effects of attitudes are discussed by Rowe and the blood pressures noted, and the

results obtained would lead to the conclusion that the difference in mental ability noted by Rowe were due to blood pressure changes. Treves<sup>14</sup> has noted in enteroptosis that the symptoms often relieved by merely pressing upon the abdomen with the hands and that "many patients are unable to move about until they have adjusted their supports or bands." Bowen<sup>15</sup> in a very complete work on the effect of exercise upon blood pressure, found that the pressure was raised during the whole of the exercise. Oliver<sup>16</sup> on the contrary found that while blood pressure was raised at first by exercise it fell rapidly if the exercise was continued. The difference in the results obtained by these two investigators is no doubt due to the difference in the exercise. In bicycling the position is somewhat flexed and the thighs press rhythmically upon the abdomen, by this means the splanchnic circulation is kept within bounds and the blood pressure is kept up. In walking, on the other hand, there is no such support and the blood drains rapidly into the splanchnic circulation. Oliver (*op. cit.*, p. 163) has proven conclusively the drain into the splanchnic area during continued exercise of this nature, namely, walking, and the fact that continued bicycling two hours and forty-five minutes does not allow of any drain. He found that after bicycling a pressure of twenty-two pounds distributed over the abdomen caused no rise in arterial blood pressure. After walking, on the contrary, one hour and thirty minutes, the same pressure caused a rise of 20 mm. The writer has verified these experiments. De Jager<sup>17</sup> finds that pressure on the abdomen has but little effect upon the abdominal arteries while it serves to express a large quantity of blood from the splanchnic veins.

*The Effect of the Tone of the Abdominal Walls Upon the Capacity of the Splanchnic Area*.—Hill and Barnard (*op. cit.*) have shown the value of the abdominal wall as a support to the circulation. In a dog suspended in the vertical, feet-down position, with the splanchnic nerves divided, the pressure fell markedly when the abdomen was opened. The slightest decrease in the tone of the abdominal walls will be followed by a decrease in intra-abdominal pressure. The cutting of the spinal cord for this reason causes a greater lowering of blood pressure than the mere cutting of the splanchnics, as has been already noted. Evidence is not wanting on this point. Treves (*op. cit.*) states that the greater part of the symptoms usually found with enteroptosis are due to the relaxation of the abdominal veins due to the decrease of intra-abdominal pressure caused by the loss of tone of the abdominal walls. Massage causes a direct emptying of the splanchnic vessels and an increase in blood pressure.<sup>18</sup> Quirin<sup>19</sup> finds that increase of intra-abdominal pressure brings up the pressure in the arteries merely by displacing the blood from the abdomen. Oliver (*op. cit.*) finds intra-abdominal tension decreased and associated with vasomotor

inability, in many forms of impoverished nutrition, chronic goutiness, anemia and neurasthenia.

The action of the abdominal muscles in maintaining intra-abdominal tension and the means of testing their efficiency have been well worked over by Harry Campbell.<sup>19</sup> Campbell lays particular stress upon the function of the transversalis as a constricting band shutting off the upper from the lower abdomen. The recti are described as separated in the infant and nominally close in the adult. In the male in good health the abdomen is flattened by their action; in the female this takes place, but the contour becomes rounded, due to the accumulation of subcutaneous fat.

*The Effect of Respiration and Aspiration of the Thorax Upon the Capacity of the Splanchnic Area.*—It is to be noted in Hill's experiment, previously cited, that opening of the thorax, after the splanchnic nerves had been cut, and the abdomen opened, caused a further fall of blood pressure; demonstrating the effect of the thoracic aspiration upon the return of blood from the abdominal veins. Leyden and Quincke<sup>20</sup> have found the negative pressure in the pleure to be as low as —42 mm. Campbell gives the following table of minus pressures in the pleural cavity:

At the end of an extraordinary expiration.—	0
At the end of an ordinary expiration....	—5 mm.
At the end of an ordinary inspiration....	—10 mm.
At the end of an extraordinary inspiration.—	—30 mm.

Donders<sup>21</sup> gives the following results:

In position of ordinary quiet inspiration....	—9 mm.
In position of ordinary quiet expiration....	—7.5
In position of deepest inspiration....	—30 to 40

This minus pressure is due to the elasticity of the lungs pulling against the comparatively rigid chest wall. This pull or suction has wide variations. In the infant it is practically nil, as the lungs fit the chest cavity with little or no tension of stretching. In old age the lung ordinarily becomes permanently stretched and fails to produce the suction evident in ordinary conditions. All organic diseases of the lungs—bronchitis, pleurisy and tuberculosis—diminish it, and in emphysema, it is reduced to a minimum. In fevers, as in typhoid and diphtheria, it is diminished. The bulging of the chest in pneumonia is due not ordinarily to a positive internal pressure, but to a diminution in the negative pressure.

This elasticity of the thorax is a factor in determining the amount of pulmonary suction actually efficient upon the circulation of the abdomen. The suction cannot be greater than the elastic resistance of the thoracic wall. In early youth this elasticity is greatest and the negative pressure lowest. It is at this time that any weakening of the thoracic wall from malnutrition gives us the familiar result of a depressed sternum, and its exaggerated form, the "Trichterbrust." In adult life, however, the rigidity of the chest wall has become established, pulmonary suction is finally resisted, and becomes effective,

as a potent factor not only in causing the upward flow of blood from the splanchnic area, but in causing the return of the lymph and the blood from the azygos and upper body veins.

It is evident that the variations in the negative pressure of the chest cannot fail to cause variations in the rate of inflow of blood to the thorax. We shall expect during inspiration an increased inflow, and during expiration a decreased inflow; also, owing to the same reason, we should have a decreased outflow during inspiration and an increased outflow during expiration. This should cause the chest to contain more blood at the end of inspiration than at any other time. Heger and Spehl found that the lungs contained 1-13 to 1-12 of the total blood in inspiration, and only 1-15 to 1-18 in expiration. Hill<sup>22</sup> concludes that "in natural breathing the air and the blood volume change together and in the same way."

From the foregoing facts it is evident that the respiratory mechanism is most potent in returning blood from the splanchnic veins.

*The Effect of Variations in Splanchnic Capacity Upon Blood Pressure.*—Arterial blood pressure depends primarily upon the force of the heart beat, the volume output per beat, the rate of beat, and the peripheral resistance. Turning to the cardiac conditions alone we should observe that, other things being equal, the greater the output per beat the greater will be the arterial pressure; also, the greater number of beats per minute the greater will be the pressure.

All combinations of these factors are possible. The stimulation of the vagus will cause a slower beat and a diminished output per beat. By stimulation of the accelerator nerves in the dog, Woolridge<sup>23</sup> obtained an increase of output per beat and a consequent rise in pressure without any acceleration. Munzel<sup>24</sup> and Roy and Adami<sup>25</sup> obtained an acceleration of the heart without any increase in blood pressure.

Roy and Adami (*op. cit.* and <sup>26</sup>); Howell and Donaldson (*op. cit.*); Tigerstedt<sup>27</sup> and others have found that the heart output depends largely upon the amount of blood available to the heart in the great veins. Anything increasing this amount of available blood causes a rise in pressure. Abdominal massage, abdominal constriction, muscular exercise, etc., all cause this result by constricting the splanchnic area.

Any factor causing a decrease in splanchnic tone, such as warm baths, fatigue, disease, exercise (second stage) will cause a lessened venous inflow, a decreased output and a lowered blood pressure.

The importance of this mechanism in controlling the blood pressure has but recently been exploited, and has hardly reached the text-book stage. That the splanchnic mechanism is a most potent one, may be seen by the fact that excitation of the splanchnic nerves will produce a greater arterial pressure than the closure of the thoracic aorta with a clip<sup>28</sup>, and also by the

fact that the complete failure of its vasoconstriction means the collection of practically all the blood of the body within its veins. Recent work by Romberg and Pässler,<sup>21</sup> and Pässler and Rolly,<sup>22</sup> goes to prove that death from diphtheria and pneumococcus septicemia is due not to cardiac failure, as hitherto believed, but to vaso-motor paralysis, and that the heart at death is still able to contract. Patients may thus be treated with vasoconstricting elements, instead of cardiac stimulants.

*The Method of Using the Test.*—The patient is directed to lie down flat upon a couch with no head rest. The armlet of the blood pressure instrument is then placed around the upper arm. This should be arranged so that it bears the same relation to the heart lying as it will when the patient is standing, so that no hydrostatic error will be included. Absolute quiet is insisted upon, relaxation of the muscles is necessary, and all emotional disturbances should be guarded against. The pulse rate is then taken by quarter minutes for at least four successive quarters. These should be recorded until we arrive at a plateau in which the heart is steady, the indication of which may be taken to be the point where four records show no decrease. These four records forming a minute's record should be noted for comparison with the standing rate. Without releasing the grip on the radial artery, the systolic pressure should be taken.

This should be taken twice, and if any large difference is noted, a third time; and the average struck. If there is any considerable variation noted, it may be due to several disturbing factors, such as an uncomfortable position, emotional disturbances, nervous muscular contractions, holding the breath, etc., all of which should be eliminated. These items recorded, the patient is allowed to stand and the same records taken in the same way with the same precautions.

It is important that the pulse rate should be allowed to fall to its standing normal after rising, for it is accelerated by the muscular act of getting up. The blood pressure also rises considerably at first (though it may fall), but it strikes a balance as a rule a little before the pulse rate does. We may now compare our results and arrive at a conclusion as to the condition of the individual. The whole test takes less than five minutes.

It is advisable at first to repeat the test and corroborate the findings of the first examination; with a little practice, however, a repetition is unnecessary.

*Range of Results.*—In "normal" cases the heart rate increase varies from 0 to 43, the systolic pressure from plus 18 to minus 12, the diastolic, from 0 to plus 18. Various combinations of these have occurred. The usual combinations are "regular"—that is, the rise in systolic pressures is in inverse ratio to the rise in the pulse rate; both factors being equally significant, for good or for bad.

*Case I.*—A., aged eighteen years; football player; weight 185 pounds; very muscular; 10:30 A.M.:

	Pulse rate.	Systolic Pressure.
Lying .....	58	120 mm.
Standing .....	58	132 mm.
Difference .....	0	+12 mm.
Estimation as per scale A.		

This shows the least possible increase in pulse rate, viz.: Zero with nearly the greatest possible increase in systolic pressure.

*Case II.*—S., aged thirty-five years; a teacher, athletic, "in good shape," after the school day, 3 P.M.:

	Rate.	Pressure.
Lying .....	61	110 mm.
Standing .....	85	110 mm.
Difference .....	+24	+0
Estimation as per scale E.		

This case shows a considerable rise in heart rate, 24, approximately, the middle of the scale and coupled with it no change in pressure; also a middle term.

*Case III.*—V., aged seventeen years; quarterback football team, "in good shape," according to his own statement; weight 125 pounds. At the end of the football season, 11:20 A.M., twenty minutes after a recorded amount of exercise:

	Rate.	Pressure.
Lying .....	68	100 mm.
Standing .....	104	94 mm.
Difference .....	+36	-6 mm.
Estimation as per scale H.		

This case shows very great increase in pulse rate and a considerable decrease of pressure. A "regular" variation, and a very poor record.

In these cases just cited, each factor is proportionately as "good" or "bad" in its significance as the other. If this were the invariable rule it would be necessary to record but one of these factors, for the other would be easily calculated as in inverse ratio to it. This, however, is not the case, as the following "irregular" cases show:

*Case IV.*—S., aged seventeen years; athlete; weight 140 pounds; 11 A.M., "not feeling very fit," coffee with breakfast; walked one and one-half miles to school and took two periods of hard school work, one standing in laboratory.

	Rate.	Pressure.
Lying .....	64	128
Standing .....	72	118
Difference .....	+8	-10
Scale E.		

This shows a slight increase in pulse with a marked fall in pressure. A "good" pulse rate increase with a "bad" fall in pressure.

*Case V.*—B., aged sixteen years; athlete, weight 130 pounds; somewhat overtrained; 11 A.M., simple breakfast, no exercise, two periods of easy school work.

	Rate.	Pressure.
Lying .....	68	100
Standing .....	104	110
Difference .....	+36	+10

Showing a great increase in rate—a bad feature; coupled with a considerable increase in pressure—a good feature.

*Validity of Results.*—A test of this sort can only at present be proven by empirical methods, and to these we must resort. There is no other way known to the writer whereby the efficiency of the splanchnic mechanism may be determined by which a comparison of results and a proof might be established. We can, however, test the efficiency of the individual and observe how nearly he will follow out our predictions as regards his "condition" in his athletic and other work. Should a man work poorly after this test has shown him an "A," with splanchnic mechanism presumably in good order, we should have cause to doubt the validity of the test. Also should a man whose record places him an "E" or below show up well, in athletic events or other strenuous work, we should again have reason to doubt our test. Such is not the case. Without exception the athletes who have so been tested by this method have *invariably and fatally carried out predictions*, even though ignorant of the meaning of the test.

A second method more easily followed out is the testing of these individuals whose condition and general efficiency is approximately known. Here, though we may meet with some surprises, the following are several cases typical but in no way selected:

1. In V., already cited as Case III, whose record was taken four times during the course of the day, his index ran G, G, H and H—during the day, his pulse increased 28, 36, his pressure fell from —2 to —12 at different times. On being questioned it appeared that he had not been sleeping very well, though he was in "good shape." He begged off from his physical training work of the afternoon and was absent the next week, having "caught cold and a fever."

2. *Case VI.*—T., teacher, aged thirty-two years; weight 190 pounds; athlete. Had six hours' sleep, hurried breakfast, "fair shape"; one of the twenty best tennis players in the United States, gave a record of +27 rate, and +6 mm. pressure at 8:30 A.M.; +19 rate and —0 mm. pressure at 3 P.M., both equal to E index. Played tennis at 4:15 to 6:15 with a very much inferior player; won the first two sets at 6—0, 6—3, lost the next three 6—8, 3—6, 0—6, demonstrating very conclusively his lack of "staying qualities" on this particular occasion.

*Case S.*, quoted at Case II.—Ran three blocks after a car one-half hour before test, and felt somewhat dizzy on standing. "In poor shape," though a "10 2-5 man" in the hundred yards

dash five years ago. At 8:30 A.M., pulse rate increased +36, pressure —12 mm., passed a miserable day, not feeling well.

*Case VII.*—F., coach of track team; fair athlete; "in fine shape." Test at 10:30 A.M., and gave an index F, with increase of rate +20 and pressure —7. A few days afterward ran a 220-yard dash; this was followed by a mild case of collapse, with the usual unloading of the stomach afterward.

These and many other cases show decisively that the estimations of poor "condition" are accurate. On the other hand, estimations of good condition have proven equally accurate.

The condition A is a somewhat unusual one, only three cases were found in an investigation of 38. One was Case I, already cited, the full-back of a football team, whose work shown as particularly successful on a very successful team. He was practically untiring, was never "laid out," and was a remarkable player in every way. The second was an assistant director of physical training who kept in the best of condition and was remarkably "long winded" in continued work, as in wrestling and basketball.

The third was a young man, a student of good, though not unusual mental and physical ability, a member of the track team, whose work was principally on the long runs, where he showed not a great deal of speed, but a consistent ability "to keep at it," though he was apparently not very strong.

Aside from this method of proving the validity of the test we may seek to prove it by taking individuals of a known condition and observe the correspondence of the results. This has been used and has given much information concerning the accuracy of the test. In a few cases where the findings of the test disagreed with the condition as predetermined, the case was not made out clearly in favor of the empirical methods, whereby the first estimation of condition was made. In several of these particular cases subsequent observations on these patients demonstrated the accuracy of the test as against the other methods used.

An interesting and an important item of proof of the validity of the construction of the scale and the balancing of the two factors was brought to light in an investigation on the condition at different periods of the day. It was found that in most cases the condition gradually became worse during the day, but each of the two factors might show a wide variation. The following case is typical:

*Case.*—R., aged seventeen years; member of track team, one mile, not very good runner but able to "finish" well. (See table on next page.)

*Medical Aspects of the Test.*—By the use of this test we can estimate in a real way the progress made in our chronic cases and the value of the remedies applied. It is inapplicable to any but ambulant cases, for rest in bed interferes with it strongly. A moderate amount of rest

	Increase in Pulse Rate.	Increase in Systolic Pressure.	Index.	Remarks.
9:45 A.M.	0	+ 10	A+	Slept well, no exercise.
10:50 A.M.			A—	After a lesson in physics.
11:45 A.M.	+ 8	+ 12	A—	After lesson in algebra.
12:20 A.M.	+ 5	+ 6	B	After lesson in French.
1 P. M.	+ 4	+ 15	A	After lunch and rest; no coffee.
2 P.M.	+ 14	+ 16	A—	After history lesson.
2:25 P.M.	+ 16	+ 8	B—	After one-half mile slow run.
2:30 P.M.	+ 18	+ 8	B—	Fifteen minutes hard exercise.
2:38 P.M.	+ 18	+ 8	B—	After five minutes rest, feeling tired.

in the run-down will increase the efficiency of the vasomotor mechanism, but long-continued rest decreases its efficiency, from disuse, to a marked extent. The fall of cerebral pressure and consequent syncope caused by even the sitting up in bed of a patient long recumbent is familiar to all. Its chief use in future will no doubt be in diagnosis of the amount of damage to the general vitality any hidden disease or any course of life has produced in the patient under our observation for the first time and also in the estimation of the progress made under our management.

In the guidance of our therapeutics we may look for a field of usefulness. It is not enough to know how a drug affects the blood pressure, which is but vague information, we must know how it affects that most important function, the vasomotor control.

The writer has applied this test to a number of hard-worked business and professional men who have come under his care, with most satisfactory results. In every case it formed an accurate and reliable index to real improvement. It was very much more steady in its readings than would be expected from the apparent variations in observed condition, which were extremely variable, but it seemed to check real improvement much more positively than could be determined by observation.

In one case of neurasthenia, in which a relative degree of sexual impotence was a symptom, the index followed the regaining of this function very exactly, and marked a relapse as accurately.

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#### INTUSSUSCEPTION.

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NOTWITHSTANDING the large per cent. of intussusception in the young, I find men to-day that are blind to such symptoms and children dying from the want of prompt action on the part of the attending physician. For instance, invagination tumors have been mistaken for prolapse of the rectum, for polypi or for hemorrhoids, and have been excised. It is more the purpose of this paper to bring out discussions on this subject, and impress upon us the importance of a thorough knowledge of intussusception, than to present any new thought that in my feeble way I might offer. Intussusception consists in the invagination of one portion of the intestine into another. It occurs most frequently in infancy, being at this age the most common cause of acute intestinal obstruction. The accident is not common, but the life of the patient generally depends upon its prompt recognition. The condition is nearly always a descending one, in contradistinction to the post-mortem invaginations, which are often ascending ones. The following varieties have been found: The ileocecal, in which the ileocecal valve passes down into the colon; the ileocolic, in which a portion of the ileum passes through the valve; the ileal, affecting the ileum alone; the colic, in which the colon is alone involved, and the colicorectal, affecting the colon and rectum.

The cause of 34 per cent. of intussusception occurring in children under one year of age, is in all probability the weakened condition of the walls of the bowels and in all cases the etiology is supposed to be irregular peristalsis. In most cases the ileum enters the cecum or the colon; less frequently the ileum or the colon or cecum enters itself, or the colon enters the rectum.

The mechanism of one form of intussusception was demonstrated by R. T. Morris, of New York, to the Philadelphia Medical Society. He exposed the ileum of a rabbit and it was observed that when it was touched with sodium carbonate, contraction of the circular fibers of the bowel at the point touched would take place in from fifteen to thirty seconds. The longitudinal fibers of the bowel, still carrying on peristaltic movement (a reversed peristalsis by the way), would invaginate that portion of the bowel which was in a state of firm contraction. He did not know the exact value of this experiment, except that it showed the mechanism of one form of intussusception. It is known that certain ptomaines produce muscular spasm, and it is fair to assume that some cases of intussusception are due to a poisoning of the muscular fibers of the bowel, as in the experiment. In post-mortem intussusception, as he had watched it, there had been paralysis of the circular fibers of the bowel, and an adjacent segment of bowel had dropped into the relaxed portion, almost the reverse of the mechanism demonstrated in this experiment. We do not, however, stop to think just what mechanism formed the intussusception we have under consideration, but are we sure that it is a case of intussusception, and just what methods we shall pursue to bring about the desired relief? In a large number of cases it is impossible to determine the exact cause of the intestinal obstruction without actual exploration of the abdominal cavity; but intussusception is capable of more certain diagnosis than any other form of acute internal strangulation.

If there is a sudden seizure of severe abdominal pain with vomiting, and the pain is noticed to come on in paroxysms, and there is a frequent passage of mucus, and perhaps blood, too, from the rectum, and on examination an elongated tumor is felt, hardening up under the finger during each paroxysm of pain and then softening if not disappearing again, it is evident that we have a case of intussusception in the acute form. In some cases the end of the intussusception can be felt per rectum. When vomiting sets in early, is frequently repeated and quickly becomes stercoraceous, and when the belly is uniformly and only moderately distended, and the excretion of urine is small, the obstruction is known to be seated in the small intestine, and the higher up the strangulation the more marked are these distinguishing features. When, on the other hand, the abdomen is greatly distended and the vomiting is less urgent and a longer interval elapses before it becomes stercoraceous, it indicates that the obstruction is in the large intestine. The hemorrhages constitute one of the most constant symptoms; they are absent in only 20 per cent. of acute cases; they vary in amount according to the site and extent of the invagination. As soon as the process becomes subacute, the hemorrhages may cease or temporarily dis-

appear. On the other hand, large, gangrenous, putrid pieces of intestine may be passed per rectum. Lobstein mentions a peasant woman of about thirty who was suddenly seized with an attack of intussusception of the bowel, and was apparently in a moribund condition when she had a copious stool, in which she evacuated three feet of bowel with the mesentery attached. The woman recovered, but died five months later from a second attack of intussusception with ileum rupturing and peritonitis ensuing.

All of the above remarks have been relative to acute intussusception; but we have a form under the name of chronic intussusception which includes those cases of intussusception having a duration of one or more months. Their extreme importance is shown in the words of Dr. Treves, that no form of intestinal obstruction offers so many difficulties in the way of its recognition, and no form has been the subject of more error in diagnosis. This form appears most frequently in adult males. Its course is most irregular. The onset is sudden in only about one-third of the cases—a point, when present, of much value in the diagnosis of this from other forms of chronic obstruction. Pain, seldom severe, may be entirely absent for long intervals, these becoming shorter as the disease advances. Vomiting is marked in only about half the cases; it is feculent in only about 7 per cent. The action of the bowels varies greatly. As a rule they are irregular, more often with a tendency to diarrhea than toward constipation. In about 50 per cent. a bloody discharge from the anus may be expected. Distention of the abdomen is slight and may be absent save during attacks of temporary obstruction. A tumor is to be felt in about half the cases. The general condition is one of wasting and anemia, the patient not infrequently dying of marasmus.

None of the symptoms described above, however, is pathognomonic, and only by careful consideration of the separate data can a mistake in diagnosis be avoided.

Now, having made our diagnosis by a careful study of the foregoing symptoms, the only thing in my mind to do, and to be done *at once* (anyhow within the first forty-eight hours of the trouble) is surgical interference. I say surgical interference because the great majority of cases come to that; and I deem it dangerous to waste time with other methods. The sooner the abdomen is invaded and the mechanical derangement relieved by mechanical means, the better for the patient. The old-time method of giving opium and belladonna and raising the pelvis and lower limbs of the child, and passing into the bowels the nozzle of a Lund's inflator, or a full-sized catheter well smeared with vaseline, attached by tubing to a bellows, and by this method filling the child full of wind, has long since been deemed too dangerous and abandoned. It is also risky to indulge very much in the clyster; on account of the weakened con-

dition of the walls of the bowels and the danger of perforation. It is impossible to give medicine by the mouth, on account of the incessant vomiting which is nearly always present. Hence there are only two things to be done—one, to place on the abdomen hot fomentations and await nature's good will and pleasure; or place the patient under anesthesia and enter the belly wall, relieving all abnormal conditions found therein.

I desire to describe a typical case which came under my care recently: Mrs. E. brought her three-year-old daughter to my office suffering intense pain at times in her abdomen and with incessant vomiting and great tenesmus. It was easy for me to make the diagnosis of intussusception. I sent her to the hospital, informing her of the gravity of the case, and prepared to operate. In about thirty-six hours from the commencement of the attack we had completed our operation. Before entering the abdomen, however, we could feel an elongated tumor along the course of the descending colon. We found with very little difficulty the intussusception, which consisted of about five inches of the descending colon swallowed up within itself. After breaking up with the fingers some slight adhesions, and with gentle traction, the gut was disengaged and the strangulation was relieved. Within the next six hours the bowels moved copiously *three times*, without any blood. There was no rise of temperature and my patient made an uneventful recovery. I will also state here that in all laparotomies in children, it is well to administer an anesthetic when the first dressing is made. There is nearly always fright, and the little patient will cry and strain, and you will likely have the stitches giving way and an abdominal rupture. I had one case like this, which made me very cautious with my first laparotomy dressings.

Fortunate indeed are we to find these typical cases. More often we grope around in the dark until the true light is seen only through an exploratory operation. But let me reiterate what has been said—in all cases of intussusception, I believe it far safer to operate than trust to any other method or methods of treatment. First be sure that you have intussusception, then operate, and nine chances out of ten you will be doing the right thing for your patient and yourself.

**Chemistry of Nephritis.**—The chemistry of the blood in nephritis has been studied exhaustively by F. ENZER (Zeitsch. f. klin. Med., Vol. 57, Nos. 1 and 2) with the following results: In parenchymatous nephritis, the proportion of albumin to globulin in the blood is altered in that the latter is in excess. In the interstitial form the proportion is about normal. Other changes in the parenchymatous form are a decrease of lecithin and lime in the serum. There are other minor differences, but to determine whether these are constant or accidental will necessitate a larger number of analyses.

#### A CASE OF RETAINED INTUBATION TUBE TREATED BY GRADUAL DILATATION.<sup>1</sup>

BY FIELDING LEWIS TAYLOR, M.A., M.D.,  
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A. K., MALE, aged three years and two months, was first seen by me the latter part of November, 1903. He had then been ill with slight fever for four or five days, but had not shown any signs of croup until the evening of November 24. During the evening of November 25, Dr. J. I. Metzger saw the patient for the first time. He observed a separating necrotic membrane on the tonsils and administered antitoxin. There was at that time a moderate amount of laryngeal stridor. Marked dyspnea, however, developed rather acutely toward seven o'clock the following morning. When seen by me about eight o'clock, November 26, there was absolute cessation of breathing, and Dr. Metzger was endeavoring to perform artificial respiration. The child was unconscious, pulseless, limp and apparently moribund. Dr. Metzger stated that there had been no attempt at respiration for some minutes before my arrival.

I fortunately had a 6-7 (new scale) tube on the obturator, already threaded, which I had fixed for another and older patient. There was no time to lose, and I inserted this without difficulty. Then artificial respiration and precordial massage were resorted to with success. About forty-eight hours later this tube, being too large to be coughed out, became plugged with detached membrane. It was removed without difficulty and the next smaller size (4-5) introduced.

November 30, four days after the original intubation, this tube was removed, but reintubation was required after two hours. I now used the built-up O'Dwyer special tube 3, to change the points of pressure.

December 4, five days later, this was removed, but intubation became necessary again after eight hours, when an ordinary three-year tube was inserted.

December 12, eight days later, this tube was removed. The child recovered his voice after three days, and appeared to be progressing satisfactorily, when, December 21, nine days after the last extubation, I was urgently called by the attending physician, who said that dyspnea had been severe for several hours, and was unrelieved by ordinary measures. The family stated that there had been more or less difficulty in breathing for the previous three days, which had grown progressively worse. A three-year tube was inserted, which was removed four days later, on December 25.

January 3, nine days later, I was called to intubate and introduced tube 3. Some force was required to send it home. Just as before, for the previous three days there had been considerable dyspnea at times, particularly when the pa-

<sup>1</sup> Presented before the Section on Pediatrics, New York Academy of Medicine, May 11, 1905.

tient was disturbed. Nor had he been able to cough efficiently to expel accumulated mucus.

These two attacks of dyspnea, almost identical in that they began six days after extubation and grew gradually worse for three days until respiration became dangerously stridulous, led me to believe that I had a contracting cicatrix to deal with. (As the voice returned upon both occasions within a day or two and was nearly normal, it seems probable that the vocal cords were not involved.) I therefore decided to try gradual dilatation of the stricture, according to the method of Dr. John Rogers, so that after a week, tube 3 was removed and tube 5-7 (old scale) at once inserted and allowed to remain until February 17, when it was replaced by a Rogers 5-7 tube. This tube has the same maximum transverse diameter as the corresponding O'Dwyer tube, but its neck is only 3-32 of an inch narrower than the greatest breadth of its bulge.

This Rogers tube was coughed out one week later, February 24, and reinserted to be coughed out again in two days. Marked stridor followed after an hour, and reintubation was required.

Thinking that possibly this stridor was due to weakness of the abductor muscles from prolonged disuse, and hoping that sufficient dilatation had been obtained, I inserted tube 3 to allow the abductors to regain their tone. It seems that when under the same conditions, the laryngeal abductors show a greater tendency to atrophy than the adductors.

March 12, two weeks later, this little tube was removed and intubation was not required again until March 21, nine days later, when I inserted tube 4.

This first attempt to dilate the larynx gradually required sixty-eight days. I had failed the first time, but determined to begin again, and rapidly arrive at the use of larger tubes.

March 26, tube 4 was removed and a 6-7 Rogers tube inserted, to be coughed out in three days. It seemed that Rogers' thick neck tube was not as well retained as the usual one, so that I now used a 6-7 (new scale) O'Dwyer tube, which I left in place for fifty-six days, or until May 23, when I introduced tube 3 to allow the abductors to regain their tone. This tube was removed one week later, June 1, 1904, since which time the child has not experienced any trouble whatsoever. He recovered his voice at once, though for a time he was somewhat hoarse. A tube was worn, in all, 160 out of 187 days.

I think this was a case of subglottic stenosis, due to small cell infiltration and contraction of forming connective tissue, occasioned by the introduction of too large a tube, which the urgency of the case necessitated my using in the beginning.

The first reintubations after recovery from diphtheria were, I think, rendered necessary by edema of the injured mucous membrane within the cricoid, following removal of pressure. It seems reasonable, however, to suppose that the

three attacks of dyspnea which occurred in each instance nine days after extubation were due to contraction of organizing exudate rather than to edema. Long continued dilatation probably caused softening and stretching of the newly forming scar tissue and absorption of a great part of the small cell infiltration.

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#### DERMOID CYSTS OF THE MEDIASTINUM.

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(Continued from Page 499.)

57. *Warthin*. In the Pathological Museum of the University of Michigan there is a specimen of malignant teratoma of the mediastinum, showing dermoid areas. Dr. Warthin will report this case in full.

In connection with dermoid cysts of the mediastinum the case of Atlas is of interest, though it cannot be included. Joël observed a teratoma on the pulmonary artery within the pericardium. The case of Villard, which is excluded by Pflanz and Ekehorn, is quoted for reasons which will appear later. Christian gives a case mentioned by Hare which is not included in the foregoing list. From the report given by Jones of his patient, it is not apparent that the tumor was a dermoid cyst, as Madelung implies. Fofanow's case possibly should not be given here; from the very brief account of it in the abstract, it seems, nevertheless, to belong in this series. Bird reports a dermoid cyst of the sternum in which a pedicle dipped down at the juncture of the manubrium and gladiolus sterni. The case of Roser, referred to by König, has probably been reported in another form, though careful search for it has been fruitless. Not included in previous reviews are the cases of Foà, Buyvid, König (?), Kraus (history and physical examination), Foucher, Sommer, Fofanow and Predtschenski. Although the number of cases could doubtless be enlarged, still it is believed that reference has been made to nearly all of those reported up to the present time.

*Etiology*.—The genesis of these growths will not be discussed at length. The subject is gone into in considerable detail by Pflanz, Ekehorn, Christian, Dangschat, and others. The most generally accepted view seems to be that which looks upon dermoids as the result of fetal inclusion. Wilms, in his comprehensive study, reaches the following conclusions: "Dermoid cysts of the head, thoracic cavity, and a part of the cysts in the retroperitoneal and retrorectal tissue arise through misplacement of fetal elements by the invagination of glandular structures, or by the closure of fetal clefts."

Dermoid cysts of the mediastinum are infrequent findings, whereas mediastinal tumors in general are not rarities. Riegel, in 1870, analyzed thirty-six cases which he had collected from the literature: of these five were dermoids. Of two hundred and eighty-eight cases of tumor of the mediastinum, given by Hare in 1889, only ten were dermoid cysts. Harris reports a series of forty-one cases of sarcoma and carcinoma of the mediastinum from St. Bartholomew's Hospital; in de la Camp's seventeen cases there is also none of dermoid. These few references suffice to indicate the infrequency with which dermoid cysts are encountered within the thoracic cavity.

Sex has no apparent influence. Of the fifty-seven cases, the sex is given in forty-eight, showing an equal division, twenty-four males and a like number of females. The age at which dermoid cysts of the mediastinum first begin to produce symptoms is of no little importance in a diagnostic way. On this point, figures are furnished in forty-six cases. Arranged according to decades, we find:

Between 1 and 10 years.....	4 cases.
Between 11 and 20 years.....	5 cases.
Between 21 and 30 years.....	24 cases.
Between 31 and 40 years.....	6 cases.
Between 41 and 50 years.....	2 cases.
Between 51 and 60 years.....	3 cases.
Between 61 and 70 years.....	1 case.

If we again subdivide the cases falling into the second decade, we find only one between the eleventh and seventeenth years, while the four remaining cases are between the ages of eighteen and twenty. Thus, of the forty-six cases, twenty-eight, or nearly 61 per cent., came to observation between the ages of eighteen and thirty. If we should reckon from the date of onset, a number of the cases which were first observed after thirty would be seen to have shown their first symptoms before this time. The youngest patient, a sucking, is that of Medoei, while Foà's is the oldest, being sixty-one.

**Morbid Anatomy.**—It may be well to emphasize here what is quite evident from a cursory glance at the cases abstracted above, *i.e.*, that the term "dermoid cyst" is not used in this paper in its strict etymological sense, but is made to include, in addition to simple dermoids, those cysts which are designated epidermoid, as well as the more complex tumors which are often classed with the teratomata; in the latter the *sine qua non* is a cyst having a lining similar to epidermis. In connection with the morbid anatomy of these growths the points which we shall consider are only those which may have direct bearing on the symptomatology, diagnosis, prognosis, complications, and treatment.

Mediastinal dermoids vary considerably in size; the smallest are about as large as a walnut, while frequently they attain dimensions exceeding those of a child's head. Though the majority of them are in the anterior mediastinum, this is by no means always the case; the larger cysts, probably

usually originating here, soon pass beyond, or extend the confines of, this small space. The tumors are most often found beneath the upper one-half of the sternum, extending to one side, and in some cases to both sides, of this bone, but always further to one side than to the other, *i.e.*, they are placed asymmetrically. They may be found occupying the pleural sac, between the pericardium and adjacent lung, surrounded by lung tissue, resting between the diaphragm and pleura pulmonalis, or extending through the upper thoracic aperture and producing an external tumor in the lower part of the neck.

Adhesions between the cyst and the neighboring tissues are present practically without exception. The tumors adhere to the pleura most frequently, next to the pericardium, thoracic wall, great vessels, *et cetera*. The esophagus and trachea are seldom involved. The nature of the adhesions is not definitely given in many of the reports; they are not infrequently so firm, however, as to render total extirpation hazardous and, at times, impossible.

The thickness of the cyst wall is variable; in some cases it amounts to only a few millimeters, but it may be much thicker, usually as a result of old inflammation about the tumor. In the wall may be found pieces of bone and cartilage, and occasionally teeth. Bone was met with in thirteen cases (1, 3, 5, 6, 16, 22, 30, 37, 38, 42, 45, 47, 51); in four additional cases (8, 10, 17, 20) the walls were said to be calcified in places—possibly bone. In Gordon's specimen the bone was of considerable size and resembled the superior maxilla. Bits of cartilage were present with bone in eleven cases. Cartilage without bone was found five times. In eight instances teeth—one or more, up to seven—were discovered, bone and cartilage being found also in three cases and cartilage alone once.

In all carefully described specimens the inner lining of the cyst wall resembled skin. The majority presented finger-like or polypoid excrescences. On microscopical examination the correctness of the macroscopical impression is proven, since stratified pavement epithelium having a stratum corneum is found. Beneath this are usually seen hair follicles and sebaceous glands, and at times sweat glands, though always fewer in number than the sebaceous glands. In some cases—the epidermoid cysts—only stratified pavement epithelium is present, glands and hairs, either attached to the surface or free in the cyst contents, being absent. Hairs, when present, are usually more numerous on the polypoid masses.

The contents of the cyst are the result of desquamation of the epithelial cells alone—in the epidermoid cysts, in others (the larger group) there is found, in addition, the secretion of the sebaceous and sudoriferous glands and fallen hairs. Under the microscope, therefore, one may see cells resembling those of the stratum corneum of the epidermis, fat droplets, cholesterolin crystals, and hairs. The latter are generally embedded in

the pultaceous contents and may be found singly or in balls or masses of different shape. There is frequently a fluid part in which there are more solid, friable, greasy masses or "coagula." In nearly a half of the cases the cyst has perforated into a bronchus, which is most common, into the lung, externally through the skin, into the pericardium (once), and into the aorta (once), allowing the contents to escape. As much as three liters may be contained in the cyst.

The tumor presents a single cavity most frequently, with a solid portion at times forming a part of it; in five cases the cyst was multilocular. The smaller cysts may be lined with cubical or ciliated epithelium. Sarcoma and carcinoma may develop in the cysts.

**Symptomatology.**—There is, in a great many cases, a fairly characteristic symptom-complex, as Ekehorn maintains; taken in conjunction with the results of objective examination, the symptomatology may be even more valuable.

Foucher describes a latent period during which the tumor gives no evidence of its existence. As a rule, this continues to the time of puberty, when there is a marked tendency for the first signs or symptoms, referable to a tumor of the mediastinum, to appear, owing to sudden, rapid development which the cyst seems to take on. Exceptions to this rule are seen in the cases of Sormani, von Török, Medoei, von Eiselsberg (52), and Madelung (54), where the first symptoms came on in infancy or childhood. Again, there may be no signs of a growth in the mediastinum till long past the age of puberty, and, in women, even of the climacteric, as is evidenced by Türk's patient. In fact, the latent stage may be the only one, and the dermoid may be an accidental finding at autopsy, the patient never having had symptoms suggesting this condition; such was the case with Sommer's patient, the symptoms finding a satisfactory explanation in the chronic pulmonary tuberculosis, from which the patient died.

In the great majority of the cases there is, however, an active stage. Its onset is by no means always characteristic; indeed, it is seldom that the condition has been correctly diagnosed early, and this is only possible under certain circumstances. Trauma, or pressure on the thorax, has been given by patients as the starting-point of their symptoms occasionally. In Bergman's case the patient attributed his disease to pressure; Madelung's patient developed a pleural effusion following a blow on the chest wall, while in my own case the patient dates his trouble from trauma in the region of the heart. It is not inconceivable that a sharp blow may cause the rupture of a tense cyst. The pneumonia described by my patient was likely an effusion of the contents of the cyst into the pleura, as in Madelung's case. Generally, however, the onset cannot be ascribed to a definite cause. The earliest symptoms vary considerably, and, as stated, are usually those which may accompany many intrathoracic affections.

In thirty-three cases statements are given in regard to the onset. In nine (2, 3, 4, 24, 27, 40, 43, 49, 50) the earliest symptom was dyspnea, usually associated with pain in the chest, at times with cough or a feeling of pressure. The dyspnea is present only on exertion most commonly; it may develop acutely, and occasionally it is paroxysmal and vomiting may occur. Pleural effusion ushered in the disease five times (21, 23, 37, 38, 48), while in Godlee's patient an effusion followed shortly after the appearance of dyspnea and acute pain in the side. In another case (56) an effusion was possibly the first effect of the tumor. Pain has been the first thing noticed by the patient in four instances (13, 34, 35, 37), being referred to the shoulder twice, to the ear and side of the chest once each. In a fifth case cough has been associated with the pain (7). Three times hemoptysis (23—effusion followed, 36, 39) with cough has been the initial symptom. The patients had the symptoms of pulmonary phthisis twice (6, 16), leaving the mode of onset somewhat problematical. Asthma (5), pneumonia (17), abscess (42), and a tumor in the neck (55) have been noted. It is evident, therefore, that there is nothing typical in the mode of onset in dermoid cyst of the mediastinum.

As the disease progresses, the initial symptoms usually become aggravated and are accompanied by other manifestations of intrathoracic disease.

Dyspnea may be urgent at the onset; more commonly, as stated, it is noticed only on exertion, and in the remarkable case of Lebert this was practically the only evidence of the morbid process for more than forty years. It may be paroxysmal, associated with cough, hemoptysis, cyanosis, and vomiting; or there may be periods, lasting months, during which the patient suffers from this symptom, followed by marked remissions, in which breathing is normal. In the later stages of the disease difficult breathing is more constant and severe, and it may become so extreme as to cause death.

Pain is a frequent symptom. It is usually acute, seldom dull and aching. In a certain proportion of the reported cases the pain has radiated to the shoulder (11, 12, 13, 24, 34, 35, 53, 56), to the ear (35) and back of the head (13), and down the arms. In one instance (11) paretic symptoms ensued in the affected arm. The arm may feel numb in the absence of pain (55). Often the pain is paroxysmal, and it may vary as the dyspnea does.

There is nothing typical in the cough. It may come on early and usually is not especially troublesome at first. Like the dyspnea, it is not infrequently paroxysmal. The expectoration, however, is of very great importance in some cases and should always be carefully and thoroughly examined. The quantity of the expectorated matter varies greatly; at first it is small in amount, later becoming more copious, so that 500 c.c. in twenty-four hours may be raised. In some

instances large quantities are raised suddenly after rupture of the cyst, such as is seen at times in empyema. The odor of the sputum is often foul; this may appear first after a hemorrhage. The sputum may have its origin from two sources, viz., the bronchial mucous membrane and the cyst. That arising from the former may lead to the suspicion of bronchiectasis, but differs in no way from the sputum which may be obtained from any case of mediastinal tumor; after there has been rupture of the cyst into a bronchus or an open lung cavity, the material which is expectorated becomes of great moment, and microscopical examination may now establish the diagnosis. The finding of epithelial cells resembling those of the horny layer of the skin, fat droplets and cholesterolin crystals is highly suggestive of dermoid cyst, while the presence of hairs in the sputum is pathognomonic of this condition. Unfortunately the latter are not expectorated in all cases in which the cyst has perforated into the air passages, even when they are contained in the contents of the tumor. In at least twenty cases there has been a communication between the cyst and the bronchi; in ten instances (2, 6, 9, 13, 24, 27, 38, 45, 46, 56) hairs were expectorated in the sputum. This furnished the means of arriving at the correct diagnosis in seven cases (9, 24, 27, 38, 45, 46, 56). In Cloëtta's patient the attending physician looked upon the hairs as a deception. It is quite possible that in those cases where hairs have been lacking in the sputum, though present in the tumor cavity, their absence may be explained by the fact that they are frequently rolled up into ball-like masses too large to pass through the opening; Ekehorn's case (38), in which "concrements" made up largely of hair, were expectorated, would seem to bear directly on this possibility.

Not infrequently hemoptysis has been noted; it is more often a later occurrence, and may be so severe as to lead to exitus (7, 29, 36, 45, 51). In some cases, on the other hand, there has been a slow but somewhat constant bleeding, so that the sputum is bloody.

In the later stages the patients may have fever, usually remittent, and edema of the ankles with or without ascites; or a terminal infection may cause death.

The course of the disease is variable and has been divided by Dangschat into three main groups. Most frequently there is an insidious onset with gradual, constant increase in the intensity of the symptoms. Less often the onset is similar, followed later by sudden development of severe and often fatal symptoms; or the symptoms may come on suddenly and with great severity in the beginning, the further course of the disease being irregular, periods of remission alternating with exacerbations.

The condition lasts, as a rule, one or more years. Estimating the duration as accurately as possible from the histories, the following data are obtained:

Duration.	Number of Cases.
44 years	1 (4)
24 years	1 (27)
13 years	1 (24)
10+ years	1 (55)
10 years	2 (7, 54)
9 years	2 (53, 56)
6 years	1 (45)
5 years	3 (11, 36, 37)
4 years	3 (21, 31, 34)
3½ years	1 (32)
3 years	3 (16, 42, 43)
2 years	2 (13, 49)
1½ years	1 (1)
1 year	4 (38, 39, 50, 51)
11 months	1 (41)
9 months	1 (3)
2 to 3 months	1 (12)

The disease is, therefore, essentially chronic in its course. In Mandlebaum's case (41) the patient died of toxemia following pneumonia, which came on after operation. Virchow's patient (2-3 months) had malignant disease; in the somewhat similar case of Kraus and Jores (32) the history and duration suggest the possibility that the sarcomatous tissue found at autopsy developed late. Besides the cases tabulated above, the disease is reported to have lasted several years in three instances (22, 35, 40). A history of chronic pulmonary tuberculosis is given twice (6, 44).

*Physical Signs.*—The patient is usually well nourished and shows no signs of cachexia. The pupils are equal, the radial pulses alike and synchronous. There is an absence of edema of the arms and the superficial veins are not distended. The larynx is negative.

*Inspection.*—In a few cases a tumor, which may extend below the clavicles, has appeared in the neck (1, 11, 13, 35, 53, 55); fluctuation has been present, and at times a pulsation, never described as expansile. The tumor may be bilateral. More often there has been observed a fulness or bulging of one side of the chest, usually anteriorly. Such a condition has been found thirteen times (3, 21, 24, 32, 34, 41, 42, 43, 48, 49, 50, 51, 56). This is situated generally between the second and sixth ribs in front and may involve the sternum. The bulging may be found low down posteriorly, as in von Török's patient. The important thing in connection with the fulness or bulging, as shown by others, is its chronicity, its persistence for months or years. It remains, at times, after recovery from effusion into the pleural cavity. Inspection may also reveal diminished or absent expansion over the prominence.

*Palpation.*—The alteration in the expansion is confirmed by palpation. In addition, there has been a decrease or entire absence of tactile fremitus over the prominent or dull areas in the few instances (12, 32, 34, 37, 48, 49, 56) where it has been noted.

*Percussion.*—This shows an abnormal area of dulness on the thorax, corresponding to the ful-

ness or prominence, where such exists. Most commonly the dulness is absolute, due to the proximity of the tumor to the chest wall, with the consequent crowding out of the lung tissue. In nearly one-fourth of the cases, and the proportion is much greater if we reckon only those in which results of physical examination are given, the area of dulness suggests encapsulated pleuritic exudate, especially when the other signs obtained on palpation and auscultation are taken into account. The figures illustrate this point. The dulness begins high up in front, extending downward to the lower lung border. The upper border of the dull region, beginning above and in front, inclines outward, downward and backward, a fact alluded to by Dangschat, so that we obtain an area not unlike the usual one in pleurisy with effusion, except that it is reversed and has not a Damoiseau's curve. In one case (56) there was relative dulness over this region. Again a small area of dulness may be found anteriorly, or there may be a dull region in front separated from a similar one behind by resonance (49). In one instance (45) the dull area decreased in size after coughing, which led to the expectoration of a large amount of sputum. A point worthy of consideration is the fact that Traube's space may remain clear. In the case of a left-sided area of dulness, this speaks for an extrapleural cause.

*Auscultation.*—Over the dull area absence of all breath sounds is the rule. Where relative dulness exists, there may be weakened vesicular or bronchial breathing, the latter being the result of compression generally. Râles, moist and dry, are commonly found and are not necessarily confined to one side. In my case they were fairly well limited to a portion of the left upper lobe; since there was definite evidence of a communication between the cyst and the bronchial tree, the inference was natural that the râles might be attributable either to bronchitis resulting from irritation by the contents of the cyst or to the latter alone or to both. One should expect to find the ausculted spoken voice diminished and the whispered voice absent over the affected region of the chest. The possibility of obtaining signs of open cavity, due to emptying of a perforated cyst, should be kept in mind.

*Roentgen-ray examination.*—On examination with the fluoroscope a diffuse shadow is cast by the tumor (56). Radiographs taken in one of Madelung's cases and in Türk's patient brought out nothing in addition to the findings obtained by the ordinary methods. In tumors containing bone and teeth it may be possible to demonstrate such structures in a good negative. The positive identification of teeth would lead one a long way toward the diagnosis; the finding of bone, while less typical, perhaps, would nevertheless be of no little diagnostic value.

*Heart.*—The apex may be dislocated as the result of pressure, and, in the case of a tumor occupying chiefly the left side, it has been found in the right nipple line. In the case of Cordes

signs of pericardial effusion were due to the communication existing between the cyst and the pericardium. A systolic murmur may be present at the base, and, one should look for accentuation of the second pulmonic sound.

The liver may be pushed downward when the tumor is on the right side, so that its lower edge may be felt one to three finger-breadths below the costal margin.

*Complications and Intercurrent Infections.*—Pneumonia, either croupous or lobular, has occurred eight times. It was met with early in the patients of Gordon and Marchand, and in Foà's case was the cause of death. Perforation of the cyst has already been referred to. Pulmonary tuberculosis was present in six instances. Malignant disease has developed in five cases, sarcoma being found in all, carcinoma with sarcoma in two (Virchow, Warthin).

*Prognosis.*—Without operation the outlook is extremely grave. The patients do not live more than a few years at the most after the condition is recognized, and, unfortunately, die frequently before the diagnosis has been made. With operative treatment the mortality has been reduced from 100 per cent. to about 30 per cent.

*Diagnosis.*—When expectoration of hairs occurs, the diagnosis offers no difficulties. Without this symptom, a positive diagnosis can still be made. The sputum may be characteristic, as shown above. More promising and more likely to yield valuable results is exploratory puncture. This has been carried out in a few instances. It is made into the dull area, a long needle of wide lumen being essential; a trocar, attached to a proper aspirating apparatus, would seem to be even better suited to the purpose. Repeated exploration may be necessary before puncturing the cyst or obtaining the contents. The brilliant results attained by this procedure are illustrated by the cases of Kückman and Türk. Where a fluctuating tumor exists, aneurism having been excluded, here, too, exploratory puncture is preferable, because safer. The radiograph may be of very great service. The entire picture of the disease must, of course, be taken into account. Of scientific interest, but possessing little real value from a diagnostic or therapeutic standpoint, would be the examination of the cyst contents obtained by aspiration for the "Cetylalkohol" of Sotnitschewsky and von Zeyneck, the "Acetonkörper" of Linser.

Malignant tumor of the mediastinum may offer considerable difficulty in differentiation. Dermoid cyst of the mediastinum usually appears under thirty years, malignant disease after this age. The duration of the latter is two to eleven months, usually six months, according to Feldman and others. Cachexia is rare with dermoid cyst. Pressure signs, such as edema, cyanosis, distention of superficial veins, inequality of the pupils, and laryngeal changes, which are so common in sarcoma and carcinoma, are not found in connection with mediastinal dermoid. That the signs

enumerated may occur with dermoid cyst is shown by the patients of Virchow, Pinders, Kraus and Jores, and Fofanow (?), but their significance is lost when we realize that sarcomatous or carcinomatous changes or both had occurred in each of these cases. The finding of secondary growths is, of course, of importance.

Aneurism usually occurs later in life than dermoid cyst. Etiological factors are of value. There is an absence of expansile pulsation. Pressure signs are wanting. The presence of a diastolic shock with accentuated second sound over an abnormal area of dulness makes the probability of aneurism strong, as Osler remarks. In Büchner's case aneurism could not be excluded.

Hydatid disease, especially when situated in the pleura, may parallel the symptoms and physical signs of certain cases of dermoid of the mediastinum very closely. If the sputum is negative, aspiration is the only certain way of arriving at a diagnosis, as the fluid in each disease is characteristic. More rarely hydatid cyst is found in the mediastinum; the resemblance to dermoid cyst may be considerable, as in Rose's patient.

The differential diagnosis between abscess of the mediastinum and dermoid cyst is seldom difficult. As Wilson pointed out, one of the most important distinguishing features may be the febrile reaction of the former. Some of the commoner etiological factors in abscess have also been present in mediastinal dermoid. The duration in abscess is generally shorter. Exploratory puncture is again the surest procedure. Where abscess and dermoid cyst coexist, as in von Török's case, operation alone may reveal the latter.

Other benign tumors, such as lipomata and fibromata, may best be differentiated from dermoid cyst by X-ray examination, exploratory puncture and sputum examination, together with the points to be obtained from the history.

In cases where pulmonary tuberculosis is found with a small dermoid cyst, the presence of the latter may never be suspected. Hemothorax should be easily differentiated, as a rule. Pulsating gangrene of the lung, a case of which has recently been reported by Steven, should cause no difficulty.

Encapsulated pleurisy with effusion, for which dermoid cyst has frequently been mistaken, can be excluded in many instances only by examination of the aspirated fluid. The same holds good in the case of empyema.

In a radiograph, lung calculi might suggest the possibility of bone, leading to a suspicion of dermoid. The occurrence of cough, dyspnea and hemoptysis, as in Stern's cases, may make the condition still more misleading. However, characteristic pulmonary calculi have not been found in connection with dermoid cysts, and there is the absence of suggestive findings on objective examination; no circumscribed mass is found, as a rule, in the Roentgen ray examination. The latter point would also help to exclude the rare

condition described by Förster, Luschka, Pollack and others, in which bone is found in the lung; the shape of the bone, if large enough to be seen in a radiograph, with the negative history and physical signs, would rule out dermoid.

"Flimmercysten," resulting from the original communication between the esophagus and trachea, are rare findings at autopsy (Westenryk) and need not be considered here.

*Treatment.*—The only hope of recovery lies in operative treatment. In twenty of the cases given above (11, 13, 18, 24, 29, 31, 34, 35, 39, 40, 41, 42, 43, 48, 49, 50, 51, 53, 54, 55) operation has been performed; of these fourteen, or 70 per cent, survived the operation and were either entirely cured or making satisfactory recoveries. In view of the fact that death is practically certain to follow in a few years, at the most, after the disease has progressed sufficiently to render the diagnosis possible, the indication for operative intervention is clear.

In case there is an external tumor in the neck which communicates with, or is a part of, the cyst, operation may be safe and effective. Pöhn's case is the first of this kind operated upon; in Kückmann's patient permanent cure resulted. Where the tumor is adherent to the chest wall, the danger from the operation is also small. It is in those patients where pneumothorax must be produced that the greatest difficulties may arise; these may be overcome in part, at least, by the use of the Sauerbruch cabinet or some similar device.

In most instances the treatment has consisted in evacuation and drainage of the cyst, after resection of part of one or more ribs. It has seldom been possible to make a total extirpation of the tumor, chiefly on account of the adhesions; in some cases the external skin has been sutured to that lining the cyst. A marked contraction of the cyst usually follows in the course of a few months, leaving only a small fistula.

In view of the constant and prolonged bronchitis which is present in many cases of dermoid cyst of the mediastinum, chloroform would seem to be preferable to ether, other things being equal, if resort be had to general anesthesia, as has usually been the case.

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#### THE DIAGNOSIS AND DIFFERENTIAL DIAGNOSIS OF INCIPIENT PULMONARY TUBERCULOSIS.<sup>1</sup>

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It is largely due to the perfection of our diagnostic acumen that the science of medicine occupies its present exalted position. Thousands of lives are saved to-day that would have been lost but a few years ago, because more attention is now paid to the observation of the symptoms that beset the early hours of disease. The day is past for waiting for the development of the so-called "typical pictures" before we hazard a diagnosis. Frequent operations for appendicitis have demonstrated how vague and few the symptoms may be at times, and yet how serious the pathological condition present. A physician is scarcely more justified in waiting until his patient has become greatly emaciated and has evidences of beginning softening in his lungs before diagnosing tuberculosis, than he would be in waiting until a huge tumor formed over McBurney's point, or a general peritonitis had ensued, before diagnosing appendicitis.

What then is the minimum of probability upon

<sup>1</sup> Read before the Medical Section of the Hartford Medical Society, April 10, 1905.

which a diagnosis of tuberculosis can be made? One cannot condemn too strongly the remark made not infrequently by physicians as well as laymen, that so-and-so "doesn't look as if he had tuberculosis." I doubt not that tuberculosis is frequently excluded, solely because the patient does not have the facies described by Aretaeus the Cappadocian, 50 B.C.: "Voice hoarse, neck slightly bent . . . nose sharp and slender . . . cheek bones prominent and red; eyes hollow, brilliant and glittering; swollen, pale or livid in the countenance . . . the slender part of the jaws rest on the teeth as if smiling; otherwise a cadaverous aspect."

Inasmuch as the diagnosis has to be made at times from the clinical history alone, it is of the utmost importance that this history be very complete. Unless questioned with care, the patient will forget much valuable data, and events of importance will not be mentioned because deemed of no moment by the patient. For instance, it is not enough to learn that some member of the family had tuberculosis, for our patient may not have been home for years, but if we ascertain that he was with the sick one and administered to his wants, then the probability is stronger that he contracted the disease.

Your patient rarely consults you because he thinks he has tuberculosis. As a matter of fact nothing is further from his mind. He may have a cough that has persisted in spite of medication, or he may have been losing weight and ambition; possibly he seeks relief from a disordered stomach. At another time a sudden hemorrhage will be the exciting cause for medical council. Again, a pleurisy will be complained of, or he may have an ischiorectal abscess. One or more of the above symptoms should suggest the possibility of tuberculosis, especially if occurring in one who has recently made a decided change in his manner of life, as occurs when one leaves the high school or college, where much time is spent out of doors, and engages in a confining business. Such a change may be sufficient to lower his natural resistance so that an active process may light up from organisms that have been dormant for a considerable period of time.

When a cough is present it is usually more marked in the morning and at the time at least, may be accompanied by some expectoration. The coughing spells are often of such severity that a considerable degree of nausea is caused and not infrequently they are followed by vomiting. *Paroxysms of coughing that are followed by vomiting are pretty apt to be either whooping-cough or pulmonary tuberculosis.* The considerate patient will many times quiet any misgivings you may have, by telling you that it is a "stomach cough," or a "bronchial catarrh," and that the expectorated material does not come from the lungs but from the back of the nose. Likewise we are assured that, though he may have had a few "hemorrhages from the throat," he has never had any from the lungs. Often the hemorrhage

will come on during sleep or while perfectly quiet. Some afternoon temperature, a rapid pulse and night-sweats complete the usual picture. In one extreme class of cases we have the general symptoms slight and the local signs absent or very few. I recall a young woman who complained of pain in her right shoulder. Questioning developed that she had been "running down," as she expressed it, for some time and had a slight morning cough. Chief, however, was the shoulder pain which she attributed to sweeping, as it was worse at that time. Her right apex showed signs of involvement and her sputum contained tubercle bacilli.

The second rare type is to have the local signs marked and the constitutional symptoms few. This class is most common in big, strong men who eat and sleep well and have no symptoms aside from an occasional hemorrhage. The common type has both local signs and general symptoms. The earliest signs commonly met with are slight dulness, the absence of the normal vesicular murmur—a prolonged expiration—with or without râles.

The dulness may not be demonstrable except as the clavicles are percussed directly, and it is often not appreciated until one percusses at the end of a deep inspiration. Concerning the character of the respiratory murmur in the early stage there is not an absolute uniformity of opinion, though I believe the majority of observers consider that the harsh, wavy respirations precede the period of diminution of breath sounds. As the tactile fremitus and voice conduction are normally more marked on the right, we examine the left apex with great care if we find them equal on both sides, and when they are more marked at the left apex the presumption is stronger that the apex is involved.

The most common râle in the early stage is the crepitant, usually present at the end of a deep inspiration, though often not heard until the patient coughs; at other times a mucous click occurring at or near the end of inspiration is the first sign. Inasmuch as the most common site for the tuberculous deposit is from an inch to an inch and a half below the apex and slightly nearer the posterior than the anterior surface, we must examine the supraspinous fossæ with care, as the first signs are frequently observed there. If the hair on the chest and back is thick and long it will be necessary to shave the parts before the examination can be satisfactory. When examining a patient recumbent in bed one should always observe the signs present when lying on the right and left sides respectively, for not only will the note on percussion be found to vary with the change of position, but friction râles heard on the side nearest the bed will often disappear when that side is uppermost.

It is high up in the axilla, a part of the chest difficult of examination and often neglected, that one may detect the first abnormality. With the elbow but slightly abducted from the side this

region can be satisfactorily auscultated with a Bowles' stethoscope. As an afternoon rise of temperature and a persistently rapid pulse may precede the signs in the lungs by a considerable period of time, we should be on the alert to detect them, especially in those whose family or business relation necessitate intimate relationship with the tuberculous.

The excursion of the diaphragm is diminished on the side of the lesion and may be demonstrated by Litten's sign, or by means of fluoroscope. Loomis has found the estimation of the corpulence, the thoracic perimeter, and the vital capacity to be of value in obscure cases. The corpulence is determined by dividing the weight in pounds by the height in inches, twenty-six being the normal for man and twenty-three for woman. The thoracic perimeter is the average of the inspiratory and expiratory chest measurements and should not be less than one-half the height. The vital capacity, determined by the spirometer, when normal, will be three cubic inches of air for each inch in height in the male and two cubic inches for the female. A departure from the normal in two or all of the above is quite suggestive of tuberculosis.

*Differential Diagnosis.*—In considering the differential diagnosis one first thinks of *malaria*, that haven where the ship of diagnostic doubt so often seeks refuge. In the first place malaria is an uncommon disease with us. I can recall only three or four cases that were admitted to the Hartford Hospital during the two years I was on the house staff. In the second place it has a definite symptomatology, can be diagnosed by finding the plasmodium in the blood, and promptly cured by quinine. Everything from flatfoot to otitis media has been called malaria, but I think that those who suffer most are the cases of incipient tuberculosis.

Nor should we overlook the fact that both diseases may be present at the same time. I should like to mention a case that came to the tuberculosis clinic the other day. The patient was fifteen years old and his mother said that several years ago he had had "typhoid malaria" and at that time had a high fever in the afternoon and a cough. I am not quite sure just what the nature of this particular disease is, but that it is a dire malady I am sure, as he has failed steadily since then, his cough has increased and at present the whole of the right lung is consolidated with beginning cavitation in the lower lobe.

*Chlorosis.*—Labbé<sup>2</sup> does not consider chlorosis as a disease *per se*, but as one manifestation of some other affection, more commonly tuberculosis, nephritis, syphilis, or some gastric disturbance. When no other cause can be determined he finds it is almost invariably the first manifestation of latent tuberculosis. Klebs, Jr., obtained a tuberculin reaction in a number of cases of chlorosis and Knopf mentions this fact as demonstrating the unreliability of tuberculin.

Haplin, on the other hand, reported a few years ago forty cases of true chlorosis occurring in tuberculous families, only two of which developed tuberculosis.

Notwithstanding the above, it is pretty generally believed the world over that chlorosis is a disease of itself, and that though at times associated with tuberculosis, even as Hodgkin's disease may be, it is nevertheless no more dependent upon the tubercle bacillus than is lymphadenoma.

In chlorosis the skin and mucous membranes are usually distinctly pale, but it should be remembered that persons may look pale with a normal condition of the blood, and may look of good color, although they are really anemic. It is for this reason that the actual estimation of the hemoglobin is of so much consequence. Many cases of tuberculosis look much more anemic than they really are. So similar is the symptomatology of these two diseases that we cannot make a positive diagnosis from that alone. If our patient has been losing weight and has a misshapen chest with poor expansion, it is very suggestive of tuberculosis. A blood examination and the prompt improvement in all symptoms following the ingestion of liberal amounts of iron, will, as a rule, stamp the case as chlorosis. When still in doubt, the tuberculin test, of which I will speak later, may be used.

*Uncompensated Mitral Lesions*, particularly stenosis, are sometimes mistaken for tuberculosis. The history of cough with occasional blood-streaked sputum, dyspnea on exertion, and the detection of a harsh respiratory murmur and moist râles may easily confuse one, especially as the murmur of mitral stenosis is faint or absent when compensation is broken. Yet the sharp ringing character of the first sound at the apex, the accentuation of the pulmonic second, the enlargement of the right ventricle, and the appearance of the murmur and improvement in symptoms following treatment will, as a rule, enable one to distinguish between the two.

*Bronchitis*.—In taking the histories of tuberculous cases one cannot be other than much impressed by the number who assert that their illness dates from a hard cold or an attack of grip. Thus, in thirty-four histories, I took at the Cedar Mountain Sanatorium, eighteen so described the onset. As bronchitis is such a common disease it behooves us to determine, if possible which cases are tuberculous and which are not. We should regard with suspicion all cases which do not recover after a few weeks, especially if there be associated with the cough, some loss of weight, sweats or other symptoms common to consumption; and in adults, a unilateral bronchitis is regularly tuberculous. Only frequent, careful examinations will enable us to appreciate the true condition. And I might say that one can no more make a thorough examination unless the body is nude from the waist up, than he can deliver a woman under a sheet. In

view of the fact that a bronchitis often marks the invasion of a tuberculous process, we should never lose sight of our cases until the bronchitis has subsided.

*Pleurisy*.—All pleurisies, save those accompanying an acute pneumonia, are regarded by many as being tuberculous. While this is perhaps too radical a view, yet one is impressed with the frequency with which he encounters this symptom as having occurred during the early days of the disease. I can remember Dr. Delafield saying, "Whenever a patient has the ordinary symptoms of a dry pleurisy, and after ten days, with a clear tongue, a fair appetite and no great feeling of illness, there is a regular rise of temperature every afternoon, it is probable that the pleurisy marks the invasion of a miliary tuberculosis of the lungs."

At any rate, I think, we should state fairly to our patients the possibility of its being tuberculous, and see to it that their physical condition is kept as near perfection as is possible.

Recently a very simple method has been devised for ascertaining the etiology of serous effusions in the pleural cavities. Without going into the history of cytodiagnosis I will briefly state the conclusions: Effusions accompanying an acute pneumonia have a high specific gravity, a large amount of albumin and a high percentage of polynuclear leucocytes. Transudates occurring in heart and kidney disease, have a low specific gravity, a small amount of albumin and fibrin and a high percentage of lymphocytes.

Tuberculous effusions have a relatively high gravity, a large amount of albumin—boiling solid usually—considerable fibrin and a predominance of lymphocytes. As, however, the acuteness or chronicity of the inflammatory process appears to determine the predominance of the polynuclear leucocytes or the lymphocytes respectively, we may find that the polynuclears are in excess during the first few days, if the pleurisy be a very acute one.

Opportunity was afforded me to verify the above while resident house physician at the Hartford Hospital. In all, sixteen examinations were made, and of that number six were transudates occurring as the result of cardioneuritic disease, and the remainder were considered tuberculous. These cases will be reported in detail later.

*Acute tuberculous pneumonia*, having, as it does, an onset identical with the pneumococcus pneumonia, is rarely diagnosed at first. During the early days the patient is apt to cough up considerable blood and very often, on about the third or fourth day, the sputum will become bright green in color. There is an absence of crisis, the pulse is more rapid, the sweating more marked and the emaciation more extreme than in the pneumococcus infection. If now the sputum be examined, elastic tissue and tubercle bacilli may be found. "Even then," Dr. Osler<sup>8</sup> says, "if you are old-fashioned enough you may say, 'Oh,

well! pneumonia sometimes does end that way." To add to our confusion, we will find that the acute tuberculous pneumonias often have a high leucocyte count, one of Osler's cases having 74,000 (*op. cit.*).

Another important and valuable aid to the diagnosis of obscure cases is tuberculin, which is now quite universally used by the phthisio-therapists in this country and Europe. I have employed it in a number of cases at the Hartford Hospital and found it valuable in demonstrating the tuberculous origin of suspected cases of "idiopathic pleurisy" and "unresolving pneumonia." In no case was there any indication of the slightest harm, and in two cases a note was made a few days later that the signs in the lung showing improvement.

A letter I received recently from Dr. V. Y. Bowditch expresses so well the views of a conservative yet progressive man that I will quote part of it: "When its use diagnostically was advocated so freely I hesitated for a long time before I could overcome the repugnance, foolish, perhaps, to its use. Yielding to the opinion of men in whose judgment I felt implicit trust, I began cautiously to use it in very obscure cases, feeling that by not doing so I was holding too conservative a position, perhaps, and thereby not giving the patients the benefit of a doubt that might exist. In the last two years I have used it in a considerable number of doubtful cases at both sanatoria, and although I do not consider it to be an infallible diagnostic agent, I do think it to be of service in certain cases, and I can honestly say that I have never seen the slightest harm come of it."

Dr. E. R. Baldwin, in a letter relative to its uses, said: "In short, tuberculin is not needed in most cases for diagnosis, but when needed is of the utmost value if a positive result from a small dose is obtained," and in a former article<sup>4</sup> he stated that "the latent tuberculosis in a person in apparent good health, that will not react to tuberculin, should cause no anxiety."

So firmly is the belief fixed in some lay minds, that consumption can only exist when the emaciation is extreme and the cough incessant, that nothing short of a tuberculin reaction will convince these "doubting Thomases" that tuberculosis is present.

In 1898 Ambler likened the diagnostic use of tuberculin to "hunting for a gas leak with a lighted candle." He now says, "I do not hesitate to use tuberculin at present; we have learned how to make our lamp a safety lamp." Moreover Trudeau, Ambler, Bowditch and others are not only using tuberculin for diagnosis but therapeutically as well.

You have doubtless observed that thus far I have made but scant mention of sputum examination. I am firmly convinced that there is a tendency to-day for the clinician to shift the responsibility of a diagnosis from his shoulders to that of the bacteriologist and the pathologist.

Moreover, I believe there are a large number of physicians who will exclude tuberculosis because of two, or possibly three, negative examinations of the sputum, even though the clinical evidence is in favor of it. In the earliest stage the formula of miliary tubercles is the predominating feature and during that period the bacilli will be absent from the sputum, or very few in number. Again, in some chronic cases, the germs may be absent for considerable periods of time. In one of Osler's series of acute pneumonia tuberculosis, the tubercle bacilli were not found until the twentieth examination, made on the thirtieth day of the disease. The search for the organisms should be made on several successive days, at frequent intervals, but a negative examination should not outweigh a positive clinical picture.

And what would happen if we made a mistake and told a patient that he probably had tuberculosis if he really did not have it? The treatment to-day for tuberculosis is unfortunately not a specific one. The best we can do is to improve the general condition in every possible way and experience has demonstrated that fresh air, rest, and good food will best accomplish this end.

Now, the patient whose disease is incorrectly diagnosed as tuberculosis, is at least tired out and run down, and I know of no better way for him to regain his health than by rest, fresh air and good food. He may be able to accomplish this at home; well and good. If you send him to a well-managed sanitarium where incipient cases of tuberculosis are treated, even better; for not only will he receive the benefits that accrue from the regular life and constant medical supervision, but he will be less liable to contract tuberculosis there than he would be on any of our business streets on a windy day, or when the ever-faithful street cleaner is scattering the dry dust to the four winds.

Laymen can build hospitals for the treatment of consumption, laymen can educate the masses by distribution of literature, and laymen can improve the sanitary conditions of our poor. But it is the general practitioner who must recognize the disease when it is just beginning. Many hopes and ambitions are blighted, and many lives sacrificed each year because the disease is masquerading under another name during those precious moments when a cure is possible. We must be continually on the *qui vive*, and strive to recognize the disease from its approaching shadow.

By familiarizing ourselves with nature's first signals of distress, we can oftentimes turn to a happy ending what would otherwise have been a sad catastrophe.

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## ROD AUSCULTATION.

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*The Post-Graduate*, in its number of February, 1904, contained a report on my method of "Rod Auscultation" which now, after it has been more extensively tried, I desire to supplement with some additional data, since acquired.

As is well known, to practise the method a small rod (as is here shown) is applied firmly to

[REDACTED]

the surface of the body, vertically to the latter, and the top of the middle finger passed with moderate force over the rod while the latter is steadied with the thumb and index finger. This friction produces, in the rod, vibrations, sound waves, which, in accordance with well-known physical laws, are transmitted in every direction. Hence they pass also upon the surface of the body, and, if sufficiently strong, into the subjacent organs from which they are again transmitted in every direction. If then a stethoscope be placed near the rod we can, with the ear applied thereto, hear these sound waves, and we note a sound of a peculiarly grating character, resembling somewhat the noise produced when a finger is passed over silk or similar material. If the skin is soft and not tense, the sound waves can pass through the same for only a very short distance, and likewise they cannot go very far in the loose subcutaneous tissue. If they encounter an underlying contracted muscle, or, for instance, a rib, they will naturally be transmitted into the same, and, according to its course, continue in it, becoming audible nearly over the full extent of this muscle or of this rib, provided that both stethoscope and rod are placed over the same structure; an internal organ will, therefore, under these conditions, not be able to influence the audibility of the sound waves. But the conditions are different if a muscle or a rib does not intervene between the internal organ and the stethoscope and rod, or if either the stethoscope or the rod is applied so as to avoid a muscle or a rib. In this case then it is impossible for the sound waves to be transmitted through the latter from the rod to the stethoscope, and the examination of the internal organ is no longer disturbed thereby. We shall then, since the sound waves are transmitted in every direction in this internal organ, hear the sound produced by them as long as stethoscope and rod are over this organ, and cease to hear them when one or the other has left the organ; this for the reason that the waves being reflected at the boundary of the organ, at the serous covering, are thus prevented, or nearly so, from passing to an adjacent organ; hence, the sound that is heard becomes more dull and now resembles the noise produced by a finger passing

over rubber or similar substances. (The difference in the sound is due principally to the absence of the high upper notes, which, as is well known, produce the above-mentioned grating noise and which are reflected most at the boundary of the organ.) To make still more certain it is best, every time we believe that we have found the boundary of the organ, to make a second examination by applying the stethoscope at another point, the rod, as before, being moved toward the boundary and the above described change of the sound listened for. If with both examinations the boundary is found to be at the same point, the result is bound to be correct.

The details as to the physical proof, etc., may be found in my previous articles on this subject.<sup>1</sup>

The density of the examined organ, the amount of air contained in the same, etc., cannot materially affect the examination, since the latter depends merely upon the transmission of the sound waves through a single organ; on the other hand, organs containing the same amount of air, and which therefore cannot be differentiated by ordinary percussion, can positively be distinguished from each other by rod examination, as explained by me in former papers.

Small organs are but little suited for rod auscultation, as transmission through the skin and the surface of the body is most likely to interfere with the examination. The heart also cannot, in most instances, be delimited with sufficient exactness by this method. This is more especially true of the right and left boundaries of the heart because transmission through the ribs too often plays a disturbing part and vitiates the findings. The upper and the lower boundaries are more readily determined.

It is much easier to examine the lungs, and I succeeded especially, as I have shown in the *Berliner Klinik*, Heft 181, in determining the position and extent of the apices with an accuracy impossible with any other method (except the Roentgen rays). I was enabled by this method to show that the statements of the textbooks on Internal Medicine with reference to the extent of the pulmonary apices are incorrect, that they are situated much more inward and do not by any means extend as far upward as has always been assumed by clinicians. I found the results of my examination to agree with the statements of the works on Anatomy and with my own investigations at autopsies.

By means of rod auscultation it is possible also to differentiate the individual lobes of the lungs provided they do not coalesce with one another.

It is equally possible to determine the boundaries of the liver readily and accurately if the abdominal muscles are not tense, and especially when that organ is somewhat hard—hard and

<sup>1</sup> Zur Größenbestimmung innerer Organe. Deutsch. med. Wochenschrift, No. 46, 1901; Weitere Mittheilungen über die Größenbestimmung innerer Organe durch die Stäbchenauskultation. *Ibid.*, No. 20, 1902. *Berliner Klinik*, No. 181.

firm organs being better conductors than flaccid and soft ones.

The method is of special value in cases where the diagnosis is somewhat in doubt and where it becomes a matter of importance to clear this up, as, for instance, whether an abdominal tumor that has been definitely made out has its origin in the liver or is merely situated in its vicinity—a point that cannot always be determined by palpation and percussion. The change of the friction sound in this case is bound to occur very distinctly between liver and tumor if the tumor does not coalesce with the liver; the change will not take place if it does so coalesce, the sound waves in the latter instance encountering no obstacle from which they are reflected.

If the above described physical principles of rod auscultation are always borne in mind, if the above-named causes of error are taken into consideration, and if, on the other hand, no more is expected of this method than it is able to accomplish, then, I am certain, it will be welcomed as a further and important complement to our present methods of examination.

## MEDICAL PROGRESS.

### SURGERY.

**Laparotomy in Peritoneal Tuberculosis.**—That laparotomy often cures tuberculosis of the peritoneum is undoubtedly, but the experience of D. GOESCHEL (*Deutsch. Arch. f. klin. Med.*, Vol. 84, Nos. 1 to 4) is not as favorable as that of most other authors, for in a series of 19 cases, only 16 per cent. were perfectly cured after three years. Not all cases are suitable for operation or require it. Thus, in children, as high as 33 per cent. recover spontaneously. The best results are always seen in the exudative type, while the adhesive type and the form running with tumor-formation are benefited only slightly. Where suppuration and ulceration accompany the disease, a laparotomy will often do more harm than good. The same applies to cases where other foci are already present in the body. Tuberculosis of the intestinal mucous membrane is a particularly severe complication. In very early cases, which run an acute course with rapidly increasing ascites, the sooner the operation is performed, the better. Simple puncture is rarely sufficient, since the fluid will rapidly reaccumulate. The author never employed iodoform and never resected tuberculous structures, except occasionally the appendix. The wound was generally closed entirely, except where pus was found, when a small strip of gauze was regularly introduced into the lower angle. During the after-treatment, the patients were kept in the open air if the weather permitted.

**Report of Operations Performed at the Public Clinic for Students at the German Hospital During the Session of 1904 and 1905.**—J. B. DEAVER (*N. Y. Med. Jour. and Phila. Med. Jour.*, July, 1905) reports the series of operations performed at the clinic for students at the German Hospital during the session 1904-1905; 23 clinics were given, during which 182 operations were performed with a mortality of five deaths. The deaths were from acute appendicitis, 1; cholelithiasis, 1; biliary cirrhosis, 1; strangu-

lated inguinal hernia, 1; removal of prostate, 1. The author lays great stress upon the proper teaching of pathological anatomy at the operating table, so far as is possible, rather than at the post-mortem table.

**Popliteal Aneurism, its Surgical Treatment.**—H. M. TAYLOR (*N. Y. Med. Jour. and Phila. Med. Jour.*, July, 1905), in a consideration on this subject emphasizes two points which he considers very weighty. They are: (a) In traumatic and in sacculated aneurisms we can and should preserve the lumen of the parent artery. (b) In fusiform aneurisms we should arrest the circulation through the sac, and obliterate its cavity without disturbing the outside adhesion of the sac. In both innovations we lessen the danger of calling upon the collateral circulation too suddenly. In the treatment of sacculated aneurism the statistics of Dr. Ramshoff show the advantages of the revived Antylus operation. They are mortality-proximal ligation 18 per cent., extirpation 11 per cent.; gangrene-proximal ligation 8 per cent., extirpation 3 per cent.

**Fractures and Dislocations of the Ulna.**—J. SZARZMAN WIGHT (*Am. Med.*, July 8 and 15, 1905) treats this subject in a systematic manner. There are (1) fracture of the styloid process; (2) fracture of the shaft of the ulna; (3) fracture of the olecranon; (4) fracture of the coronoid process. The dynamic relations are fully treated and the mechanism of the injuries explained in detail. The results are explained in the clinical reports illustrating the different fractures. Thus the author gives a basis from which to determine the nature of an old fracture to the ulna. The patient suffers pain in the joint; this is sometimes severe. The power of flexion is generally lost, although in some instances there is good command over the motions of the forearm, mostly for the reason that some of the fibers of the tendon of the triceps remain attached to the upper end of the lower fragment. The patient has a sense of insecurity in his injured limb, which may be best explained by saying that the coordinate action of the elbow-joint has been impaired or lost. This impairment is different in different persons. It would appear as if the coordinate circle of the joint function had been more or less broken into; this circle is made up of bone, nerve and muscle. Therefore there should be no difficulty in understanding the disability which follows the break in the correlated bone. It would seem to be nearly impossible for the ulna to be dislocated by the application of violence to its lower end, unless we take into account those cases in which there has been a fracture of the external condyle; in such a case the ulna is dislocated backward, and is accompanied by the head of the radius and the broken off external condyle.

**Antitetanic Serum in Gunshot Wounds.**—The results obtained in the treatment of gunshot wounds by the prophylactic use of antitetanic serum combined with early surgical measures is recorded by H. J. SCHACK (*St. Louis Med. Review*, July 29, 1905). The cases occurred as a result of the Fourth-of-July celebration in St. Louis, Mo. Seventy-eight cases in all were treated, and none developed tetanus. The method of treatment was as follows: The wound was freely incised, all foreign particles thoroughly removed, and the wound cauterized with 25 per cent. carbolic acid and loosely packed with gauze saturated in a 5 per cent. solution of carbolic acid. An immunizing dose (10 c.c.) of antitetanic serum was then injected into the cellular tissues of the abdominal wall. The cases were then carefully watched until all danger of tetanus had passed.

**Gall-Stones in the Common Duct.**—W. D. HAGGARD (*Journal A. M. A.*, August 12, 1905) holds that

there should be a more general early recognition of gall-stone disease before complications and common-duct obstruction occur. In the invasion of the common duct by stone two dangers are to be considered—obstruction to the flow of bile and infection. Unless the stone is tightly impacted there is still likely to be some flow, and this tends to wash away the infection. Even an impacted stone may be irregular in shape and allow some flow around it, or a round stone completely plugging the lumen may be floated back temporarily in a distended duct, thus causing the intermittent ball-valve obstruction of Fenger. During an intermission or if no infection or jaundice is present, the mortality of operation with a competent surgeon is slight, but unfortunately, as Mayo observes, "the majority of common-duct patients have either never had an intermission or have passed beyond it, and operation is no longer an election as to time, but a necessity, and, no matter how desperate, must be undertaken to save life." The complications of stone in the common duct, such as suppurative cholangitis, liver abscess, pancreas infection, cancer from prolonged irritation, etc., are noted by Haggard. The typical symptoms are very characteristic; they are, in the order of their incidence, pain, chill, temperature, sweating, hypersensitiveness and jaundice. The pain may be dull and constant, but is usually paroxysmal and cramplike. The chill, fever and sweating have a resemblance to malaria and, if jaundice be absent, may cause error in diagnosis. The gall-bladder is rarely dilated, having usually been thickened by previous infection. This is a valuable sign in discriminating the condition from about the only other one with which it is liable to be confused—obstruction of the common duct with jaundice from other causes, principally cancer at the head of the pancreas. With distention of the gall-bladder, a deep persistent jaundice generally indicates quite certainly a non-calculous origin. Jaundice itself is not an infallible sign, and should not be confidently looked for in the majority of gall-stone cases. The diagnosis can and should be made in most instances before the complications that cause jaundice occur. Obstruction being a mechanical condition, it requires mechanical treatment—operative removal. The statistics of surgery are increasingly favorable with prompt diagnosis and resort to operation. Surgery gives opportunity for the relief of the other element of danger—infestation—by drainage, and drainage, Haggard says, is the secret of success in the treatment of inflammations of the gall tracts.

**Gastro-enterostomy.**—The various operations for securing gastric drainage as a correct treatment for certain morbid conditions of the stomach are discussed by W. H. WATHEN (*The Journal A. M. A.*, June 17), and he gives not only his own views and his own special technic of posterior gastro-enterostomy, but also the opinions, obtained through correspondence, of prominent surgeons, including Mayo Robson, Moynihan, Czerny, von Mikulicz, Kocher, Murphy, Mayo, Ochsner, Park and Deaver. His conclusions from a consideration of all the facts are, in substance, as follows: (1) Some cases of acute and subacute gastric and duodenal ulcer, and many cases of chronic and duodenal ulcer, should be treated by efficient stomach drainage into the duodenum or jejunum. (2) Pyloric division and pyloroplasty for this purpose have failed and are now obsolete. (3) Gastroduodenostomy as modified by Kocher and Finney, may do in many cases, but it should be limited to such as cannot be operated on by a posterior retrocolic gastro-enterostomy with the anastomosis near the duodenal flexure. (4) Anterior antecolic gastro-enterostomy

should not be the operation of election, but only of expediency and necessity, to give temporary relief, or to meet abnormal conditions contraindicating the posterior attachment. (5) The ideal operation of election is the posterior retrocolic attachment near the beginning of the jejunum, and at the bottom of the stomach in the pyloric end, thus eliminating the loop. (6) This affords the best drainage, prevents vicious circle and regurgitant vomiting, leaves stomach and intestine in nearly normal relation, and gives better immediate and ultimate results. (7) The intestinal incision should be longitudinal and not less than two inches long, and the stomach incision of corresponding length, preferably in the oblique direction. An elliptical strip of mucosa should be excised from both incisions. (8) The anastomosis is best made by continuous suture Pagenstecher or silk), using a full curved round-pointed needle. It should be applied in double layers, the inner to include all the visceral layers and unite the cut edges of the opening; the outer, one-fifth inch away, to include the serous and subserous layers. (9) Enter-enterostomy, or closure or resection of the proximal jejunum or pylorus, is needless. It causes traumatism and leaves a deformity that may cause immediate or subsequent bad results.

**Etiology of Appendicitis.**—After considering the various theories advanced by well-known authorities, SHURLY (*Buffalo Med. Jour.*, July, 1905) considers that the consensus of opinion seems to be that the important cause is the accession and activity of various bacteria, and specifically the colon bacillus through abrasion of the lining membrane; but to assign to these bacteria any more than a secondary or exciting rôle in the causation of the disease would seem irrational, when we consider the wide distribution of the colon bacilli throughout the intestinal tract. The formerly supposed causation of appendicitis by foreign bodies, concretions, etc., is disposed of by the many appendices which harbor such things without being diseased. The same may be said of anatomical variations. The author advances the theory, that if through mechanical action, or otherwise, an abrasion or atrium is formed by which these micro-organisms, especially the colon bacillus, secure an entrance into the connective tissue and lymph vessels, and thereby set up infection, and that probably concretions are the principal agents in producing such abrasions by mechanical action.

**A Case of Congenital Urethral Stricture Associated with Hematuria and Symptoms Suggesting Renal Disease.**—J. W. CHURCHMAN (*Johns Hopkins Hosp. Bull.*, July, 1905), after reporting in detail a case of congenital urethral stricture, summarizes the interesting features presented as follows: (1) This patient presented a urethral stricture in which a positive diagnosis of its congenital nature could be made. Such a diagnosis was warranted by: (a) The history, from which all record of urethral traumatism or of venereal infection was absent; (b) the association of an obvious congenital stricture at the meatus; (c) the complete cure of the clinical manifestations by proper treatment of the stricture; (d) the presence of clear urine and the absence of symptoms after the actual stricture had been dilated. (2) The second point of interest was offered by the clinical symptoms presented. These were nausea and vomiting, hematuria and pain over the left ureter. They suggested renal or urethral disease, and obscured the diagnosis which really only cleared up by the therapeutic test. (3) In the third place, this case suggests that another item must be added to our already long list of causes for hematuria, and that congenital stricture may be associated with

blood in the urine, the source of which may probably be an hypertrophied *veru montanum*.

**Knee Injuries and How to Manage Them.**—Dr. FOREST WILLARD (*Am. Med.*, June 17, 1905) says sprains of the knee are often followed by long continued results from the fact that ligamentous, tendinous or fascial structures are torn. Permanent disability and weakness are common. An early diagnosis of the existence of such tear, or of fracture, or of dislocation of cartilages or of loose bodies, is essential. The Roentgen ray may assist. Rest, complete or partial, is the initial element of treatment. Heat and cold are the most powerful abortives of synovial inflammation. Partial fixation by adhesive plaster strapping, or fixation by plaster-of-Paris or other solid splint, with the use of crutches, is helpful. The limitation of the period of rest is, however, most important. As soon as the inflammatory signs have subsided, massage and voluntary movements are important lest chronic tenderness of the joint be induced. Serous effusion is to be removed by compression, tapping or incision. Blood clots should be removed. Displaced semilunar cartilages should be replaced by manipulating and recurrence avoided by an apparatus limiting motion. Upon recurrence of the injury, the cartilage should be stitched in place or removed. Loose bodies in the joint should be removed, when discovered. Sensitive or hysterical joints are induced by too long continuance of rest. These can only be cured by involuntary and voluntary movements, which should usually be preceded by anesthesia. Fibrous ankylosis can be overcome by forcible and cautious movements, with persistent massage, dry heat, manipulations, etc.

#### MEDICINE.

**Improvement of the Sahli Test-Meal.**—Several years ago, Sahli recommended a test-meal, the chief ingredient of which was a soup made of flour roasted in butter. Owing to the fact that the fat was held in fine emulsion by the flour, a good idea of the motor function of the stomach could be obtained if a butyrometric test was made of the expressed soup. Since the latter test required a special centrifuge the method has not become popular though excellent in other respects. H. SAHLI (*Münch. med. Woch.*, July 11, 1905) now recommends the following modification: Instead of centrifuging, the mixture of test-meal sulphuric acid and omyl alcohol is placed in the water bath for ten to fifteen minutes when all the fat will separate on the surface of the mixture as perfectly as with the centrifuge. The Sahli test-meal is also an excellent method for determining the bacterial flora of the stomach. With the Ewald or Boss test-meal a large number of bacteria are quite regularly introduced into the stomach, but the Sahli emulsion is virtually sterile when taken, since it has been boiled shortly before use.

**Intestinal Stones.**—An interesting case of intestinal concretion is related by R. NAUNYN (*Deutsch. Archiv f. klin. Med.*, Vol. 84, Nos. 1 to 4). The patient suffered from alternating constipation and diarrhea and the diagnosis presented many difficulties until many hard, light-colored masses were passed. A chemical examination showed that these were made almost entirely of a resinous matter. The patient's history then disclosed that he had been in the habit of taking resinous tinctures for a long period for a painful gingivitis. The resin was precipitated in contact with saliva and had then formed compact masses in the lower intestines.

**Diagnosis and Treatment of Gastric Ulcer.**—After a careful review of the symptoms of gastric ulcer, in which are defined the typical and a typical symptoms, C. E. NAMMACK (*N. Y. Med. Jour. and Phila. Med. Jour.*, July 15, 1905), states that before a definite diagnosis of gastric ulcer can be made, the following conditions must be excluded: hyperchlorydria, acute catarrhal gastritis, gastralgia, cholelithiasis, cancer of the stomach, intercostal neuralgia accompanying digestive disorders, gastric crisis in locomotor ataxia and other diseases of the spinal cord, and duodenal ulcer. The points of differential diagnosis are considered. The three leading indications for treatment are to improve general nutrition, to diminish the excessive acidity of the gastric juice, and to put the ulcer at rest. The author considers that the great majority of acute cases will heal under appropriate medical treatment, while surgery promises more in the treatment of chronic cases. Besides the chronic cases surgery is always indicated in hemorrhage and perforation.

**The Ethics of Consultation.**—B. D. BOSWORTH (*Journal A. M. A.*, July 8, 1905) calls consultation the highest function in medical practice and protests against the unreasonable neglect into which it has fallen. It is a duty, he thinks, of the young practitioner to avail himself of the counsel of the more experienced men with whom he has begun to compete. He also believes in exclusiveness in consultation, no matter how far the bars may have been let down, and is thankful that there is no law to prevent the exercise of individual judgment and discretion as to whom we shall meet in consultation. It is better that the medical attendant should first propose the calling of counsel, but the choice of the patient's family should be respected. He gives the mode of proceeding in an ideal consultation, and the need of conciseness and brevity, both for the sake of the patient and his friends, is insisted on, and he makes a special point that, unless it is demanded by the family physician himself and for good and sufficient reasons, no one who has been called as a consultant is ever justified in taking charge of the case, or should ever intimate that any part of the treatment did not receive his assent. Ignorance, he thinks, is the invariable excuse for the flagrant violation of ethical principles in these matters. The members of the profession ought to give more careful study to the principles of ethics that have been promulgated by the Association.

**Albuminuria in Relation to Diabetes.**—There are three distinct groups of cases in which albuminuria is associated with diabetes, according to M. LANCEREAUX (*Bull. de L'Acad. de Med.*, July 31, 1905). They are as follows: (1) Albuminuria due to arteriosclerosis with secondary lesions in the heart and kidneys; (2) albuminuria of epithelial origin, due to an intercurrent disease, particularly tuberculosis; (3) albuminuria without renal manifestations, alternating with glycosuria, and, like the latter, of nervous origin. In the first class of cases are frequently seen fat diabetics who have become albuminuric at an age difficult to determine, on account of the insidious development of this condition and the carelessness of the patient in seeking medical advice. It may, however, be said that in these cases the albuminuria appears subsequently to the diabetes and at the same age, from forty-five to fifty-five years, at which it appears in arteriosclerosis. The clinical features are an abundant, pale urine of relatively low specific gravity (1.010 to 1.020), nocturnal polyuria, a moderate amount of albumin, without or with a slight edema. Death occurs from uremia rather than from glycosuria. In

the second class of cases tuberculosis is the most common cause of the albuminuria. Among other causes is suppuration of the bladder (relatively common in the diabetic women) owing to the introduction of micro-organisms from without. The third class of cases are found among private rather than hospital patients, and are discovered only by accident. In these the albuminuria and glycosuria may be considered as two syndromes of similar origin; the author characterizes this association as the "albuminurious diabetes." This association is found particularly in obese and gouty patients.

**Sunshine and Shadow in Medical Endeavor.**—The address of J. D. BRYANT (*Journal A. M. A.*, August 12, 1905), covers the subject of the recognized results of medical science in relieving human suffering as well as the numerous annoyances and drawbacks experienced by the profession in its beneficent work. He gives entertaining illustrations of some of these drawbacks, the wiles of quackery, the much misled credulity of the public, the misappreciation of the differences between thrifty commercialism and ethical proprieties, the tendency to fads in the profession itself and to the overdoing of certain methods, etc., and the risks of falling into ruts and superficial contentment. Against all these, however, he balances the great achievements of the profession, the triumphs of surgery, the great advances made in the knowledge and origin of diseases and in their treatment and the vast increase of knowledge within the last few years all tending to diminish human suffering and adding infinite possibilities of comfort and enjoyment in human existence.

**Physical Signs of Air and Fluid in the Pleura.**—The auscultation and percussion of cases of hydro-pneumothorax generally enable a ready diagnosis. C. BÄUMLER (*Deutsch. Arch. f. klin. Med.*, Vol. 84, Nos. 1 to 4) points out that there may, however, be considerable difficulty when old adhesions of the lung or advanced changes in the lung, such as compression or cavity-formation, influence the position of air and fluid. In such cases there may be an area of exquisite tympanic percussion within the area of flatness caused by the fluid. In some cases which came to autopsy, the author discovered a stand of compressed pulmonary tissue adherent to the chest-wall. In other instances small accumulations of air are percussed through thin layers of fluid or thickened lung-tissue or strands of fibrin have formed in the fluid. The signs often change when the patient alters his position.

**Epidemic Cerebrospinal Meningitis.**—The diplococcus of Weichselbaum was found in all cases of epidemic cerebrospinal meningitis examined bacteriologically by H. LENHARTZ (*Deutsch. Arch. f. klin. Med.*, Vol. 84, Nos. 1 to 4), but in four cases other bacteria were also present. The course extended over weeks and months, even where the disease ended fatally. The mortality was not so high as reported by other authors, since 23 out of 45 cases recovered. A pronounced difference between this form of meningitis and the form caused by the diplococcus of Fraenkel, is that the latter almost always ends fatally in a few days. Leucocytosis is a constant symptom and may reach very high degrees, particularly in the more favorable cases. The best treatment is repeated lumbar puncture; this will also prevent the subsequent development of hydrocephalus. Usually 25 to 40 c.c. of fluid are removed and the needle withdrawn as soon as the pressure sinks below 100. In one case as many as 15 punctures were made. Where lumbar puncture is not successful the ventricles may be punctured directly, though here there is always danger of setting up a hemorrhage. The most common after-effects were blindness and deaf-

ness, owing to degenerative changes in the corresponding nerves. In one case, the patient recovered from idiocy and was again able to see after the use of the seton and inunctions with mercurial ointment.

**Essential Albuminuria.**—Based upon the observation of one case for 15 years, B. NEUKIRCH (*Deutsch. Arch. f. klin. Med.*, Vol. 84, Nos. 1 to 4) comes to the conclusion that essential albuminuria is a disease *sui generis* and not related to nephritis. The albuminuria was first noticed directly after an attack of diphtheria; at times the amount rose to one to a thousand, while frequently several hours later not even a trace could be detected. Casts and other renal elements were always absent and, despite the fact that the condition persisted for many years, no hypertrophy of the heart or other visceral changes appeared. Vegetable diet and rest in bed did not make a lasting impression, but with the advent of puberty the condition disappeared spontaneously. Bland diet and high altitudes are recommended and the patients should carefully avoid exposure to cold and excesses of any kind. The prognosis is very favorable since the underlying cause is probably only a disturbance in the innervation of the kidneys.

**Dr. Osler's Farewell Address.**—"Unity, Peace and Concord" is the title chosen for his address by Dr. OSLER (*Journal A. M. A.*, August 5, 1905). The medical profession is the only one, he says, that everywhere throughout the world has the same methods, ambitions and aims—it is the only worldwide profession. In a little more than a century a united profession working in every land has done more for the race than any other body of men. Any great discovery in any part of the world is common property at once. In referring to the things needed to bring about perfect unity in the profession in this country, he laid special emphasis on the need of reciprocity in the medical practice laws in the various States and Territories, and the need for consolidation of medical schools and for the recognition of those homeopathic physicians who are ready to accept the facts of scientific medicine. Osler believes that mutual concessions only are needed, such as the abandonment of special designation, and the intelligent toleration of therapeutic vagaries that have always beset the profession, but are at worst only flies on the wheels of progress. He advocates peace, but by this he does not mean cessation of our professional conflict with ignorance, apathy and vice. This must be steadily carried on. There is, however, at times, he says, a lack of professional harmony that should exist, and this is to be lamented. He thinks that there are three chief causes of the quarrels of physicians. The first is lack of proper friendly intercourse, the second is uncharitableness, and the third is the wagging tongue of individuals, who are too often ready to make trouble between physicians. He says that a physician should never listen to a patient who tells tales derogatory of other physicians, and should not believe them, even if he thinks they may be true.

#### PATHOLOGY AND BACTERIOLOGY.

**Transmission of Disease by Mosquitoes.**—J. R. TAYLOR (*Jour. A. M. A.*, July 8, 1905), gives a good summary of the facts in regard to the transmission of disease by mosquitoes, so far as known. He does not consider any of the possible methods practicable for the complete extermination of malaria, but thinks that the disease can be greatly reduced in prevalence. As regards yellow fever, he believes the methods instituted by Gorgas in Cuba, if thoroughly carried out, would exterminate the disease. The same methods

will apply for the extermination, or at least the diminution, of filariasis. He believes in quarantine in all possible cases of transmission of disease by vessels, that is, a quarantine based on the natural history of the disease as we know it. The isolation of infected persons is essential. For the destruction of mosquitoes, sulphur fumigation is most effectual, but has its inconveniences. The powdered leaves of datura (jimson weed) mixed with saltpeter and burned, an ounce of the mixture to each two hundred cubic feet of space, is a cheap, safe and effective method of destroying hibernating mosquitoes. Pyrethrum and formaldehyde are said to be effective against hibernating insects, though the former only stupefies the mosquitoes, which should be swept up and burned after its use. To exterminate the stegomyia or yellow fever mosquito, all water receptacles should be treated with oil or made insect-proof, and drainage and flushing of ditches, etc., should be practised. Drainage methods are even more necessary against the malarial bearing type, which breeds especially in swamps. Taylor views the general results of experiments by the New Jersey mosquito commission in regard to the merits of various larvicides, such as petroleum and the creosote preparations.

**Leucocytes in Malignant Growths.**—J. B. FARMER, J. E. S. MOORE and C. E. WALKER, note (*Lancet*, August 5, 1905) some observations relating to the behavior of leucocytes in very early carcinoma. Three cases were studied, and in all the phenomenon was identical, suggesting a cytologic change peculiar to the transmutation of normal cells into carcinomatous elements. It was found that there was a distinct zone of transition from the normal to the cancerous element round the periphery of the tumor. This led to the conclusion that the growth had not originated from a single cell, but was being involved by direct conversion from many functioning elements. Leucocytes which had invaded the cytoplasm of epithelial cells were obscured. In many instances the cell and its included leucocytes were both dividing mitotically. It is deduced that a mixture of the respective chromosomes occurs, a process analogous to fertilization.

**An Experimental Contribution to the Treatment of Cholelithiasis.**—WILLIAM BAIN reports (*Brit. Med. Jour.*, August 5, 1905) a series of experiments to determine (1) the changes, if any, undergone by gall-stones introduced into the normal gall-bladder, (2) the fate of such calculi when cholecystitis was artificially produced, and (3) results of medication. Sixteen dogs were used. In some of them, along with the calculi, cultures of the *Bacillus coli communis* were introduced. All of the dogs gained weight after operation except two. The experiments showed that the normal gall-bladder will dissolve moderately large calculi in about three weeks. When cholecystitis is present the stones do not disappear, though there was always a reduction in weight. Of the medicaments used, two of them, namely, a mixture of urotropin and iridin and Harrogate old sulphur water gave fairly positive results in promoting dissolution. Ichthoform calomel, cholelysin and olive oil had no appreciative effect.

**Enzymes and Anti-Enzymes of Inflammatory Exudates.**—The serum of an inflammatory exudate has the power of inhibiting the action of proteolytic ferments contained in the leucocytes, according to E. L. ORR (*Jour. of Exper. Medicine*, June 10, 1905). This anti-enzymatic power is possessed by the blood-serum from which it doubtless passes into the exudate. In the later stages of inflammation there is some diminu-

tion of this anti-enzymatic power. The antibody contained in the serum is destroyed by a temperature of 75° C. The proteolytic ferments of the leucocytes act both in an acid and in an alkaline medium, but are most efficient in the latter. The anti-enzymatic action of the serum is favored by an alkaline reaction, but is completely lost in an acid medium.

**The Bacteriology of Pertussis.**—A study of the bacterial contents of sputum obtained from cases of pertussis at the New York Foundling Asylum was made by M. WOLLSTEIN (*Jour. of Exper. Med.*, July 15, 1905). She was able to isolate bacilli belonging to the influenza group, but differentiated from *Bacillus influenzae* by means of agglutination reactions with the blood of patients and of immunized laboratory animals. The bacilli were found with the greatest ease early in the attack, i.e., when the cough had persisted for about two weeks and the whoop was just established. They continued very numerous in the sputum throughout the paroxysmal stage. Agglutination was effected by the serum of the child in dilutions of 1:200 and occasionally in 1:500.

**The Nature of Mallory's Bodies in Scarlet Fever and Measles.**—A study of the protozoon-like bodies observed by Mallory in the epithelial cells and in the lymph spaces of the skin, in material from autopsies on scarlet-fever cases, was made by C. W. FIELD (*Jour. of Exper. Med.*, July 15, 1905), who paid particular attention to these bodies as obtained from blister-fluid. He believes that the bodies found in sections of skin from cases of measles and scarlet fever are part of the protoplasm of the epithelial cells which has been so changed in its chemical nature that its staining reaction differs from that of the surrounding protoplasm. The small, round extracellular bodies found in the living patients may arise from degenerating cells. In sections of control and normal skin, the nuclei of the epithelial cells were often indented by the cell protoplasm, giving them an appearance similar to those indented by Mallory's bodies. It would seem that if these bodies of Mallory's were protozoa they would have been found in the sections from both the living and the dead skin of scarlet fever and measles, as they were present in the blister-fluid. Their absence is certainly more suggestive of a degeneration than of a protozoon. This view is also borne out by the fact that they were not found immediately after death, but were present in another specimen from the same case removed twenty-four hours later. It would seem probable that the bodies found in the blister-fluid were the products of degeneration and cystolytic activity, because they were found in the antitoxin rashes as well as in the cases of scarlet fever and measles. The bodies present in blister-fluid resemble very closely these granular bodies found in blood under certain conditions, and seen in vaccine lymph and in emulsions of tissues and in exudates. The author thinks, therefore, that they are for the most part, if not wholly, products of degenerating tissue cells and of leucocytes, and within certain limits specific to scarlet fever and measles.

**Some Conditions Determining Variations in the Energy of Tumor Growth.**—LÉO LOZE (*Am. Med.*, August 12, 1905) asserts the rate of tumor-growth is not only influenced by the species into which the tumor is transplanted, but also by variations which exist among individuals or families of the same species. Under certain conditions a state of active immunity can be experimentally produced. It can be accomplished more easily with some tumors than with others. The energy of tumor-growth can be experimentally

increased through successive transplantations up to a certain maximum. It is also possible to cause an experimental decrease in the energy of tumor-growth. These variations are caused by a direct stimulating or depressing effect upon the tumor cells. (Contact metastases may occur, and different tumors which are morphologically similar or identical behave differently in this respect. The greatest care ought to be exercised to prevent a tumor from touching the wound during extirpation. The fact that surgeons operating on tumors do not become infected agrees with the facts found in experimental tumor inoculations.) Tumor growth is primarily due to an increased energy of growth of those cells from which the tumor takes its origin; it cannot be due to a lowered resistance of the organism in which the cells carry on their apparently unlimited growth. If a tumor cannot be successfully inoculated into other animals, it is probably not due to the fact that other animals are more resistant toward the growth of inoculated tumor cells than the animal in which the tumor-growth developed originally, but to other causes still unknown.

**Etiology of Croupous Pneumonia.**—Formerly it was believed that the diplococcus of Fraenkel was the sole cause of true lobar pneumonia, but the importance of the diplo-bacillus of Friedländer was soon recognized. Now H. Schottmüller (*Münch. med. Woch.*, July 25, 1905) states that the *Streptococcus mucosus* is also an etiological factor, since he has it in pure culture in the lungs of five cases. The clinical symptoms were onset with chills, high fever, delirium, and stupor and albuminuria. Frequent complications were empyema and pericarditis. The defervescence was more often by lysis, and the sputum was generally very tenacious and hemorrhagic or orange-colored. The microscopical appearance of the diseased lung did not differ from that of pneumococcus pneumonia, but the exudate was marked by being very thick and tenacious. In a few cases the germ could also be cultivated from the blood during life. The percentage of positive blood-cultures obtained by the author in pneumonia in general was 23 per cent, but not all of these cases died. Conversely, the disease may be fatal, even if germs cannot be obtained from the blood during life. The importance of the *Streptococcus mucosus* as a cause of pneumonia is evident if the advances of serum therapy in pneumonia are noted.

**Mixed Infection of the Blood with Proteus and Streptococcus.**—Bacilli of the proteus group very often give rise to local infections in combination with other germs, particularly in endometritis, peritonitis, gangrene of the lung and in phlegmons. Such processes are generally characterized by their bad odor. General infection, on the other hand, is very rare, so that the case of G. JOCHMANN (*Zeitsch. f. kin. Med.*, Vol. 57, Nos. 1 and 2) deserves to be put on record. The patient was suffering from mastoiditis with sinus-thrombosis, but did not recover from a radical operation. The clinical symptoms did not differ from those of other cases ofogenous sepsis, and cultures made from the blood shortly before death showed very many colonies of proteus and few of streptococcus. Agglutination tests were made, and it was found that the serum of the patient reacted with proteus in a dilution of 1:640 and with typhoid bacilli in a dilution of 1:160. The serum of rabbits inoculated with the proteus obtained from the blood also agglutinated to some extent the typhoid bacillus.

**The Etiology and Pathogenesis of Pernicious Anemia.**—C. H. BUNTING (*Bull. Johns Hopkins Hosp.*, June, 1905), after reviewing the general etiological

causes of pernicious anemia as presented by various authors, states that it does not seem necessary to assume any specific predisposition to anemia, at least not a predisposition with a pathological condition of the marrow as a basis. He considers there is a disproportion between the resisting power of the individual and the strength of the pathological agent producing the anemic state—a disproportion shown by an inability of the bone marrow to generate a sufficient number of red-blood cells to supply the deficiency. This disproportion is especially marked in the so-called "aplastic" cases, in which after death the marrow is found to be fatty and with practically no sign of regeneration. Whether this variability in reaction depends entirely upon a variation in the intensity of the toxic agent or in part to the condition of the individual is the same problem as is presented in many diseases, as, for example, the valuable resistance offered to invasion by the tubercle bacillus, or to the toxic agents producing a nephritis or a cirrhosis of the liver. It would seem to depend more on a general lack of resistance on the part of the individual than to any special predisposition or weakness of the bone marrow. It is obvious that an anemia may be produced in several ways: First, by insufficient or defective blood formation; second, by excessive loss of red blood cells from the circulation; third, by excessive destruction of red cells; or, fourth, by a combination of the preceding factors or any two of them. The author considers that the theory of Lazarus, that the megaloblastic transformation of the marrow is due to the presence of some toxic substance, approaches most closely the true solution of the question of pathogenesis. The absorption of this toxic substance is probably of intestinal origin, which acts on the circulatory blood-producing hemolysis and through the circulation also on the marrow, resulting in a faulty hyperplasia. The author concludes by stating that a toxin is present which destroys the red cells both in the circulation and in the marrow, that it reduces the erythrogenetic groups more or less to the megaloblastic centers, diminishing greatly the regenerating power of the marrow and resulting in a discharge of megaloblastic cells in the hasty effort to supply the circulation. Thus, the regular orderly development of the groups of the marrow cells is interfered with and a short cut is taken from the megaloblast to the macrocyte, an imperfect, immature cell, as shown by its polychromatophilia and granular basophilia.

**Preservation of Milk with Peroxide of Hydrogen.**—Most methods of rendering milk sterile are objectionable since they either add substances injurious to health or else render the milk less digestible. An ideal disinfectant has, however, been found by E. BAUMANN (*Münch. med. Woch.*, June 6, 1905) in peroxide of hydrogen. If added in amounts of 0.35 pro mille, the milk will keep for many days and the number of germs present will actually decrease to a very low number. When pathogenic germs, such as typhoid, cholera, dysentery or tuberculosis, were added to the milk, they could not again be detected after the most searching bacteriological examination. It is always best to heat the milk up to 50° C. after the addition of the peroxide, since a certain amount of free oxygen will be formed, which is strongly bactericidal. In order to avoid any dilution of the milk it is best to use the new preparation of peroxide, perhydro, which contains 30 per cent. The taste is in nowise altered, and numerous experiments showed that the digestibility is the same as before.

**Germ of Syphilis.**—Evidence is becoming more and more conclusive that the *Spirocheta pallida*, first described by Schaudinn and Hoffmann, really is the much-sought micro-organism of syphilis. Thus, C. FRAENKEL (*Münch. med. Woch.*, June 13, 1905), has examined a large number of primary lesions and manifestations of the earliest stage of syphilis, and reports positive in almost every case. In lesions undoubtedly not syphilitic similar structures could never be found. Great patience and high magnifying power are necessary since the organisms are very small and not evenly distributed: thus it may happen that twenty or thirty may be seen in one field and none in a large number of fields examined later. The technic is very simple: the cover-slips are immersed for ten minutes in alcohol, dried and placed for sixteen to eighteen hours in the azur solution recommended by Giemsa. The number of convolutions shown by the spirilla vary: some possess four to six and others as many as fourteen to sixteen. The author believes that they undoubtedly stand in etiological relation to syphilis, but cannot understand why they were not discovered before.

**Beginning and Growth of Intestinal Cancer.**—D. MARCKWALD (*Münch. med. Woch.*, May 30, 1905), has been so fortunate as to observe two cases of intestinal carcinoma in their very earliest stages. In one the growth had started in the walls of the appendix and had attained the size of a pea, while the second was somewhat smaller and had been discovered accidentally at an autopsy. It is probable that the starting point in each case was a cell, or a number of cells, situated in the submucosa and most likely of fetal origin. No signs of inflammation or of trauma could be detected, so that the cause of the sudden growth of the cells remains unexplained. Owing to increase in size of the cell-nests, the surrounding tissues will be pushed apart so that the lymph-spaces dilate and give ready access to particles of the tumor. The walls of the arteries will thicken and the endothelial cells lining the intima hypertrophy and proliferate. The stroma of the surrounding tissues does not participate in the increased growth, but remains passive. The mucous membrane covering the most prominent parts soon becomes necrotic, since the supply of blood is more or less interfered with. Metastatic growths may be found in the immediate neighborhood of the original tumor, so that if the latter has attained a large size it may be absolutely impossible to say what is primary and what secondary.

**Action of the Roentgen Rays.**—It is very evident from the article of O. ROSENBAECK (*Münch. med. Woch.*, May 30, 1905) that many problems relating to the action of the Roentgen rays upon the animal body are still unsettled and call for extensive experimentation. What is known is that the white cells, and probably to a less extent also the red cells, accumulate in the tissues of the skin. A loss of hemoglobin and a leucopenia will thus result quite constantly, but this is due in great part to an actual destruction of both kinds of cells in the blood-stream. If the spleen of an animal, treated for a long time with the rays, be examined, it will be regularly found very rich in iron. It is not known if the blood changes actually inhibit the production of new leucocytes in the bone marrow, and if this inhibition is temporary or permanent. Clinical experience seems to incline toward the former, since most cases of leucemia rapidly became worse when the treatment was discontinued.

**The Urine in Chronic Diseases and in Collapse.**—In the urine of heart disease, independent of the existence of edemas, C. KLIENKEBACHER (*Münch. med. Woch.*,

June 20, 1905) has almost always found a slight amount of albumin, together with an often enormous number of hyaline casts. The other elements are usually not increased excessively. The hyaline cylindruria lasts a variable length of time, and the prognosis is generally worse if it accompanies edema than in the presence of edema alone. Hyaline cylindruria, persisting for days or weeks, was observed only in cases which died soon, while if the condition lasted only a few days, the symptoms were unusually severe and often amounted to a real collapse. At autopsy, the chief changes were those of a renal congestion, and a nephritis was only rarely present. Concerning most chronic diseases the following statement may be put down: Shortly before death many hyaline casts make their appearance in the sediment. The amount of albumin varies, but is usually very slight. Here, again, a nephritis is usually absent, the condition of the urine being solely due to disturbances of circulation, such as precede death. In a large number of other diseases the same condition was found, and the author believes that a thorough examination of the urine will very often aid in differential diagnosis. If a pronounced hyaline cylindruria is present the condition of the patient is serious and recovery doubtful.

**Streptococci in Variola and Varicella.**—Since various protozoa are being found in the different infectious diseases of hitherto unknown etiology, H. DE WAELZ and E. SUGG (*Münch. med. Woch.*, June 20, 1905) again draw attention to their former researches on smallpox and the allied diseases. In the lesions of smallpox cases, as well as in the blood, they encountered quite constantly a streptococcus which morphologically does not differ from other streptococci, but which is readily agglutinated by the serum of the patient as well as by the serum of vaccinated individuals. In the vesicles of cases of chickenpox another streptococcus was seen, toward which the serum of the patient behaved specifically. On the other hand, the smallpox serum did not affect the varicella streptococcus, and vice versa. In a large number of doubtful cases the authors could settle the diagnosis by means of the agglutination test, and the subsequent history always proved them to be correct, so that the method has great practical importance. Streptococci from other sources were never agglutinated by the serum of variola or varicella cases.

**Cause of Death After Burns.**—If a large portion of the skin of rabbits is treated with boiling water a small percentage of animals die very soon. Since these are generally the ones that have been imperfectly narcotized the probable cause here is shock. Even if these cases be excluded the time which elapses before death sets in varies considerably. During the first twenty-four hours, H. PFEIFFER (*Virchow's Archiv*, Vol. 180, No. 3), found considerable changes in the blood, manifesting themselves in the altered shape of the red cells and the hemoglobin contents. The urine is at first hemorrhagic, and later has an acid reaction and contains albumin. The cerebral symptoms amount to a primary stage of irritation, followed by apathy and somnolency, but sometimes there is a secondary increase of reflex irritability just before death. The pathological lesions include changes in the kidneys, ecchymoses and ulcers in the intestines and stomach, and degeneration of the heart and liver. The urine possesses distinctly toxic properties toward rabbits and other animals, which increase steadily up to the fifty-sixth hour. It could furthermore be shown that this toxicity is not due to the presence of blood-

coloring matter or to the acid reaction of the urine. The poison could be detected earlier in the urine than in the serum of the animals experimented upon; it possesses both a local necrotic and a general neurotoxic action. If injected into mice a period of irritation will first be noticed, followed by paralysis and cessation of respiration. With some urines the necrotic action is more pronounced, and rarely hemorrhages into the intestines and diarrhea will follow. The toxin is easily decomposed if exposed to daylight and also passes through bacterial filters. The principles causing necrosis are destroyed by short heating, while the neurotoxic agents are frequently unaffected or rendered more potent. It is not likely that these toxins are formed at the site of injury, but the proteid molecule is probably merely altered by the heat, and from this altered molecule the toxic molecules are then formed in the body. Hemolysis and agglutination of allied blood, by means of the blood of scalded rabbits, could never be observed to any marked degree, and the death of the latter can certainly not be attributed to blood changes. The intestinal ulcers so commonly seen are not caused by a direct action of the heat, since they are also frequent, if distant parts, such as the hind legs, are scalded. They are due to the toxin, toward which the intestinal mucosa is particularly intolerant.

**Granules in Lymphocytes.**—According to the original classification of Ehrlich, the lymphocytes and large mononuclear cells differ from the other white cells of the blood—in that they do not possess specific granulations. More recently, however, granulations have been discovered and D. LEVADITI (*Virchow's Archiv*, Vol. 180, No. 3), now concludes that their occurrence is quite frequent, though inconstant. As far as histochemical and color-reactions are concerned, they are specific, hence the name X-granulation has been proposed.

**Experimental Tricuspid Insufficiency.**—Since tricuspid insufficiency is only rarely found as isolated valvular lesion, the opinions concerning the changes in the heart vary considerably. Theoretically, one would expect a dilatation and hypertrophy of the right ventricle and of the right auricle, with the possibility of perfect compensation. A tricuspid insufficiency could be brought about in rabbits by destroying the valves, and E. STADLER (*Deutsch. Arch. f. klin. Med.*, Vol. 83, Nos. 1 and 2) found that the theoretical assumption was correct for the weight of the right ventricle, but more so that of the right auricle was much higher than under normal conditions. The weight of the entire heart was about normal since the left side had become atrophic. It follows that compensation was not perfect, for the left heart could not have thrown enough blood into the vessels; with lesions of a very slight degree, however, the left ventricle was nearly normal in size and the heart action probably also normal. If the greater part of the valves was destroyed, the animal died either at once or in a few hours or days; if the lesion was less severe, circulatory disturbances appeared, while with slight destruction the animal seemed perfectly well. Clinically, tricuspid insufficiency behaves like the mitral, but is more serious since there is no part of the heart which will aid in the compensation. The parenchymatous organs of the abdomen are prone to undergo serious changes, which may account for the severe cachexia.

**Finer Structure of the Lymphocytes.**—By means of a special method of treating blood-films, H. SCHRÖDER (*Münch. med. Woch.*, June 27, 1905), has been able

to discover distinct granulations in almost all of the lymphocytes. Briefly, the film is hardened for twelve hours in a mixture of formaline and Müller's fluid, and then for twelve hours in plain Müller's fluid, and finally for thirty to sixty minutes in a 1 per cent. solution of osmic acid. A hot, 20 per cent. solution of acid-fuchsin in aniline water is employed for staining, after which the smear is differentiated in picric acid alcohol. In good specimens, all granulations except the basophilic kind will appear stained, those of the lymphocytes appearing somewhat elongated, in close proximity to the nucleus and of a yellowish red hue. They are found in the normal blood as well as in leucemia and other conditions, and differ from lymphocytic granulations described by other observers.

**The Toxin of Fatigue.**—Further observations made by W. WEICHARDT (*Münch. med. Woch.*, June 27, 1905), proved that while his toxin may be obtained in large quantities from the muscle-juice of fatigued animals a simpler way would be to treat the muscle-juice of a normal animal with some reducing agent, such as sulphite of sodium. The toxin thus isolated is in every way identical with the original toxin and will be readily saturated by the antitoxin of the latter. A toxin may also be obtained with the aid of reducing agents from the albumin of placenta, brain, pollen and even eggs. The antitoxin neutralizes each one of these as readily as the muscle-toxin.

**Spirocheta Pallida in Syphilis.**—Reports on finding the *Spirocheta pallida* of Schaudinn in true syphilitic lesions are so numerous that even the most sceptical are beginning to believe that this organism has something to do with the development of the specific lesions. It is, however, clear from the article of B. KIOLEMENOGLOU and F. v. CURE (*Münch. med. Woch.*, July 4, 1905), that non-specific lesions have not yet been searched sufficiently for similar organisms to enable a definite conclusion. Thus, the authors have found *Spirocheta* which could in no way be differentiated from the true *Spirocheta pallida* in the balantic secretion of an inflamed phimosis, in simple balanitis, in the pus of a gonorrhoeic, Bartholinian abscess and of scrofulodermatic abscesses, and also in broken-down carcinomata and in pointed condylomata. The *Spirocheta pallida* was never found alone, but always in company with the *Spirocheta refringens*.

**Situs Transversus and Atresia of the Pylorus.**—H. M. LITTLE (*Johns Hopkins Hosp. Bull.*, July, 1905), reports a case of a newly-born child suffering with atresia of the pylorus. On account of the obstruction a gastro-enterostomy was performed on the sixth day, but the child died fourteen hours after the operation. The diagnosis of complete obstruction of the pylorus or upper portion of the duodenum was based on the following considerations: (1) The vomiting of a large amount of amniotic fluid shortly after birth; (2) recurrence of vomiting not regularly after the ingestion of small amounts of fluids, but as soon as approximately 20 to 30 c.c. has been given; (3) the presence in the stomach of entire amount of a feeding (15-20 c.c.) when the stomach was washed out two hours after its ingestion; (4) the absence of bile-staining of the vomitus or fluid obtained at lavage; (5) the presence and passing of meconium gradually showing more and more the appearance of bile; (6) the absence of any sign of digested milk in the stools as late as the seventh day; (7) the uniformly subnormal character of the temperature; (8) the persistent loss of weight; (9) the anuria; (10) the fact that the mother had hydramnios. At autopsy there was found complete transposition of the thoracic and abdominal

organs. The stomach showed that the pyloric end ended abruptly behind and to the left of the head of the pancreas.

#### PHYSIOLOGY.

**The Specific Nature of Precipitins.**—An investigation of the mooted question of the specific nature of the various precipitins was made by A. HUNTER (*Jour. of Physiol.*, July 13, 1905) with the following results: The albumin, euglobulin, and pseudoglobulin of ox-serum are each capable of leading to the formation of precipitins; and these precipitins are in a limited degree specific. They are mixtures of at least four distinct antibodies, of which albumin yields only one, while euglobulin and pseudoglobulin each yield three. The production of precipitins follows a wave-like course, and is accompanied by an intermittent leucocytosis, the number of leucocytes at any moment bearing an inverse relation to the amount of precipitin.

**The Action of Various Drugs on the Small Intestine.**—It was possible for R. MAGNUS (*Pflüger's Archiv*, May 8, 1905) to prepare cat's small intestine in such a way as to get rid of every trace of Auerbach's plexus. Under the influence of stimulating poisons, such preparations react with a uniformly continuous contraction, while preparations containing the plexus react by means of rhythmic contractions. In small doses atropin acts upon Auerbach's plexus, stimulating the intestinal movements, while in large doses it paralyzes both nerves and muscles. Nicotine at first inhibits the intestinal movements through its action on the plexus, and later its action in this is to excite these movements. Even large doses do not cause paralysis. Combined doses of atropine and nicotine produce paralysis. Muscarin excites the centers of the plexus. Pilocarpine powerfully stimulates the movements. Physostigmin stimulates preparations that contain or do not contain the plexus. In the latter it produces rhythmical contractions.

**Action of the Metallic Ferments on the Formed Elements of the Blood.**—A study of the effects on the blood cells of subcutaneous injections of metallic ferments, particularly electrolytic solutions of gold, was made by A. ROBIN and M. P. EMILE-WEIL (*Bull. de l'Acad. de Med.*, July 24, 1905). In general, the injection is followed by a leucolysis, which in the normal individual is slight, but in conditions accompanied by a leucocytosis this destruction is frequently intense. It is succeeded either by a secondary leucocytosis or by a return to the equilibrium. The leucolysis affects principally the polynuclear neutrophiles. The red blood cells are not much affected, there being a tendency to a slight diminution in their number. It is worthy of note that diverse substances, such as pilocarpine, atropine, digitalis, salicylate of soda, quinine, etc., have a similar effect, namely, a short initial hypoleucocytosis, followed by a hyperleucocytosis. Ether and chloroform have the same action. M. Bize has found that the antidiaphteritic and antistreptococcus sera have also the same action on the leucocytes. The author suggests that this similarity between the metallic ferments and the antitoxins may not be a mere coincidence.

**The Absorption of Chloroform in the Later Stages of Anesthesia.**—The amounts of chloroform absorbed late in anesthesia are not great, and the breaking down of the drug, which is said to take place in the body, is at the best a small quantity, according to the researches of B. J. COLLINGWOOD (*Jour. of Physiol.*, May 9, 1905). It would also follow that when once anesthesia has been fully established, the dosage of the chloroform should be adjusted to prevent the blood giving up chloroform, rather than with the idea of pour-

ing more of the drug into the organism. Previous observations show that the dosage of chloroform required to abolish the corneal reflex constantly decreases with the prolongation of anesthesia, sinking at the end of five hours to as low as .5 per cent. It would thus appear that when the organism is fully saturated with chloroform a very low percentage is sufficient to maintain anesthesia.

**The Action of Adrenalin.**—Apart from the general poisonous properties that are suggested by its chemical structure, adrenalin has one peculiar power, according to T. R. ELLIOTT (*Jour. of Physiol.*, July 13, 1905). Independent body cells, nerve-cells and their processes, skeletal muscles and visceral muscles in union only with sacral and cranial visceral nerves are influenced by it, as they are by any featureless poison. Its single characteristic is the aptness to stimulate plain muscle and gland cells that are or have been in functional union with sympathetic nerve fibers. In all vertebrates the reaction of any plain muscle to adrenalin is of a similar character to that following excitation of the sympathetic (thoracico-lumbar) visceral nerves supplying that muscle. The change may be either a contraction or a relaxation. In default of sympathetic innervation plain muscle is indifferent to adrenalin. Extent of reaction varies directly with the frequency of normal physiological impulses to rapid change of tension received by the muscle in life through the sympathetic nerves. A positive reaction to adrenalin is a trustworthy proof of the existence and nature of sympathetic nerves in any organ. Plain muscle, when denervated, shows increase of the capacity for irritation by adrenalin than it had previously possessed. Sympathetic nerve cells with their fibers, and the contractile muscle fibers, are not irritated by adrenalin. The stimulation takes place at the junction of muscle and fiber. The irritable substance at the myoneural junction depends for continuance of life on the nucleoplasm of the muscle cell, not of the nerve cell. Such peculiar irritability makes the profound biochemical distinction between all post ganglionic nerves of the thoracico-lumbar-visceral class, whether motor or inhibitor, on the one side, and all other efferent nerves with their respective junctions on the other.

**The Changes in the Viscosity of the Blood during Narcosis.**—The viscosity of the blood does not remain constant during narcosis, according to R. BURTON (*Jour. of Physiol.*, July 13, 1905). It is increased by deep and lessened during light narcosis. These differences cannot be considered of great importance, and the changes which result from the administration of moderate doses of morphine and ether or morphine and chloroform must at most be very slight. The changes in the specific gravity pursue a parallel course to those in the viscosity, in the case of light ether narcosis. During narcosis from chloroform the inverse relationship was found to exist.

**The Action of Hyoscines, a Study of Optical Isomers.**—It has been shown by A. R. CUSHNY (*Jour. of Physiol.*, July 13, 1905) that while levorotatory hyoscynamine has a powerful action on the salivary glands, heart and iris, the dextrorotatory artificial base is almost devoid of effect on these organs. The author has since studied the differences in the physiological action of the two isometric hyoscines. Levohyoscine (lately called scopolamine) acts twice as strongly as the racemic base (artificial or dextrorotatory hyoscine) on the terminations of the secretory nerves in the salivary glands and of the inhibitory nerves in the heart. It may be inferred that a similar ratio holds in other analogous terminations. Levohyoscine and racemic hyoscine have the same effect on the central

nervous system in man and mammals, and on the terminations of the motor nerves in frogs, in which they do not seem to affect the central nervous system. From this it would appear that, as in the case of the hyoscyanines, the dextrorotatory hyoscine is practically inactive in the terminations of the secretory and cardiac inhibitory nerves, while it acts equally strongly with the levorotatory base on the central nervous system in mammals and on the motor nerve ends in frogs. On the other hand dextrohyoscine differs from dextrohyoscamine in not stimulating the spinal cord in the frog, but this may be due to its being very rapidly excreted. Hyoscyanine is practically devoid of hypnotic action in man, when given in doses which do not affect the peripheral organs.

**The Functional Connection between Auricles and Ventricles.**—In 1893, His described a bundle of muscle-fibers lying in the septum between the right and left sides of the heart, which he believed forms a connection between the auricles and ventricles. H. E. HERING (*Phüger's Archiv*, May 31, 1905) proves that this bundle, which he terms His' transition-bundle, or connecting bundle, really does functionally unite auricles and ventricles. A very small cut in the septum between the ventricles is capable of destroying the functional connection between the auricles and ventricles, provided that this cut is in the region of the bundle described by His. This discovery was made in the dog, but since the connecting-bundle is also found in the hearts of other mammals, including man, there is no doubt that in these the connecting-bundle has the same function. According to Retzen, in adult man this bundle is 18 mm. long, 2.5 mm. broad, and 1.5 mm. thick. In a four-year-old child, the greatest diameter is 1 mm. Since the connecting-bundle, corresponding to its relatively small size, can hardly be supposed to possess any other function, the question arises: Why do muscle-fibers carry the cardiac excitation, instead of nerves which have this for their proper function? The answer is that the excitation is carried from auricle to ventricle by muscle-fibers because in mammalian hearts the conduction of the wave of cardiac activity is a muscular one.

**The Force of Contraction of the Gall-Bladder and the Course of Its Motor and Inhibitory Nerve Fibers.**—To show the force of contraction of the gall-bladder and the course of its motor and inhibitory nerve fibers, U. A. CHASE (*Bull. Johns Hopkins Hos.*, June, 1905) performed a series of experiments on dogs. By means of special apparatus and after the skeletal muscles had been paralyzed by curare, the splanchnic nerves were stimulated. All possible error from direct or reflex stimulations of the skeletal muscles were entirely excluded. The author states that it appears from the results obtained that the bladder is capable of contracting against a resistance such as is offered by a column of Ringer's solution 214.5 to 313 mm. high. Moreover, the sudden maximum increase of pressure against which the bladder is working is about 200 mm. It seems evident from these figures that the musculature of the bladder is comparatively weak, and that its contractions are not at all comparable in force to those of the urinary bladder, which, according to Mosso, may contract in the dog with a force sufficient to support a column of water two meters high. Indeed, the maximum force of contraction of the bladder does not much exceed the maximum secretion pressure as determined by Haidenhain. After experiments to determine the course of the motor and inhibitory nerve fibers of the gall-bladder, the author

arrives at the following conclusions: (1) The musculature of the gall-bladder is provided with motor (constrictor) and inhibitory (dilator) nerve fibers. These fibers are found in the splanchnic nerves; (2) both the motor and inhibitory fibers arise from the spinal cord in the roots of the sixth to the thirteenth dorsal nerves. The maximum outflow for the constrictor fibers is in the tenth, eleventh and twelfth dorsal nerves. The dilator fibers appear slightly higher up and are most in evidence from the eighth to the twelfth dorsal nerves, inclusive.

## PRESCRIPTION HINTS.

### Gastralgia.—

R. Arseni trioxidi ..... gr.  $\frac{1}{2}$   
Extr. gentianæ ..... gr. ii.

M. et fiat pil. Sig. one t. i. d. between meals.  
In severe cases employ counter-irritation over the epigastrium by means of the following:

R. Ol. cajuputi ..... 3 i  
Tinct. capsici ether ..... 3 iii

Lin. camphoræ ammon ..... 3 iv

M. et Sig. For external use. Rub in for 5 to 10 minutes once or twice daily.

In still severer cases use following externally:

R. Pulv. ipecac ..... 3 ss  
Lin. crotonis ..... 3 ss

Adipis ..... 3 i

M. ft. unguent. (Sawyer.)

### Dropsey of Advanced Mitral Disease.—

R. Pulv. digitalis ..... gr. i  
Pulv. scillæ ..... gr. i

Pil. hydrarg. ..... gr. i

Conf. rosa gallæ ..... q. s.

M. Fiat pil. Sig. One to be taken thrice daily between meals. (Sawyer.)

### For Occasional Use in Constipation.—

R. Magnes. pond ..... 3 ss  
Ol. ricini ..... 3 ss

Mellis depurat ..... 3 i

M. fiat confectiv. Sig. One teaspoonful at bedtime. (Sawyer.)

### Backache of Loaded Colon.—

R. Soda et potassium tart ..... 3 iss  
Soda bicarb ..... 3 ss

Acid. tart. vel acid. citric ..... 3 iiiss

Ol. limonis ..... 3 iv

M. fiat pulvis. Sig. Two teaspoonfuls to be taken dissolved in a tumblerful of cold or warm water. (Sawyer.)

### Eczema.—

R. Lead oleate ..... 24 parts  
Liquid paraffin (B. P.) ..... 14 parts

M. et Sig. Apply locally. (Sawyer.)

### Traumatic or Irritative Dermatitis.—

R. Zincioxidi ..... 3 iiiss  
Ol. amygd. dulcis ..... 3 v

Lanolin ..... 3 v

M. et Sig. Apply to part on a cloth. (Sabouraud.)

### Hyperhidrosis of the Feet.—

R. Soda salicyl ..... 3 ss  
Potass. permanganat ..... gr. xlv

Talc. pulv ..... 3 i

Bismuth. subnitrat ..... 3 iss

M. et Sig. For external use. (Brocq.)

### Alopecia.—

R. Acidi acetici crystal ..... 3 iiiss  
Chloroformis ..... 3 iss

M. et Sig. For external use. (E. Besnier.)

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## NEW LIGHT ON THE PNEUMOCOCCUS.

It may seem almost Utopian to expect that some day it will be possible to interpret disease in terms of mathematics. Yet no less distinguished an investigator than Ferdinand Hueppe has expressed the belief that at no distant date it will be possible to apply the language of the differential calculus in the solution of the problems of pathology; for disease is a function of a number of variables, such as heredity, nutrition, climate, bacteria, etc. Translating this into the ordinary phraseology of medicine, it may be stated that in order to gain a clear conception of the nature of any morbid condition, it is necessary to consider the extremely variable character of its etiological factors.

This applies with peculiar force to pneumonia, a disease which has recently challenged the keen attention of the profession, by virtue of its gradually increasing virulence in urban communities during the past two decades. The organization of the Pneumonia Commission at the instance of the New York Board of Health was a laudable recognition of the need of probing into the variations in the causes of the disease, with the view of exercising a more effective control of the latter.

It is quite natural that the first point of attack in this investigation should be the pneumococcus,

for this is the most tangible of all the etiological factors in the disease, and the one most susceptible to hygienic control. The first burdens of the Commission were therefore transferred to the shoulders of the bacteriologists, and during the six months that these have been attacking the unsolved problems of the pneumococcus, they have not only added a fund of valuable information to the meager knowledge we already possessed, but they have also given an earnest of far greater additions in the near future. The interesting results of these researches have just been published in the *Journal of Experimental Medicine*, August 25, 1905.

The investigations were carried out in New York, Philadelphia and Boston, and special lines of research were assigned to different bacteriologists. The main problems concerned the occurrence and the varying virulence of the pneumococci and its relatives found in the human mouth in health and disease, the occurrence of pneumococci in the hospital wards, the study of the buccal flora before and after outbreaks of pneumonia, the varying vitality of the pneumococcus, and the question of mouth disinfection. Some of these subjects had already been investigated, but the discovery of newer and more precise methods of identification of the pneumococcus made a repetition of this work indispensable. The pathological laboratory of the College of Physicians and Surgeons, New York, served as the central laboratory for the organization and direction of the work, under Professor Hiss.

Professor William H. Park and Dr. A. W. Williams, assisted by a large staff at the Research Laboratory of the New York Health Department, found that the throat of a large percentage of healthy persons, whether living in the city or in the country, harbors typical pneumococci. A larger percentage of atypical pneumococci, many of which seem to be closely related to the streptococci, are found in healthy persons than in those suffering from pneumonia. These normal throats also show a lower percentage of stains of pneumococci virulent for rabbits than the cultures obtained from cases of pneumonia. One very important series of experiments led to the following conclusion, to quote the language of the authors: "Since the virulence of pneumococci may be rapidly increased for a susceptible species of experimental animal by successive passage, and since pneumococci obtained from most pneumonias are more virulent for experimental animals than those obtained from healthy

individuals, therefore the virulence of pneumococci from cases of human infection is probably increased for human beings; hence cases of pneumonia should be considered, to a certain degree, contagious, and since the virulence of the pneumococcus may be quickly increased, and since the organism is very prevalent in normal sputum, all possible measures should be taken to restrict public expectoration."

In view of this important finding, it is certainly pertinent to ask whether the municipal authorities are doing everything in their power to prevent public expectoration. Large signs are prominently displayed on the subway platforms warning the passengers against the possible penalties to be meted out to the spitting offenders, yet, judging by the extreme frequency of this act, there seems to be a general idea that expectorating on the rough roadbed between the tracks is not only allowable but is also a praiseworthy diversion.

That in the course of time an efficient anti-toxic serum will be available in the curative treatment of pneumonia, is a hope founded on tangible experimental results. Park and Williams, by means of inoculating sheep repeatedly with a pneumococcus strain, succeeded in producing a specific protective power of sheep's serum for mice against not only the homologous strain, but also against certain other strains. There is also developed an increased phagocytic power in the sheep.

A point that has an important bearing on the subject of the seasonal distribution of cases of pneumonia, is the discovery by Warfield T. Longcope and W. W. Fox that among the various cultures obtained from the saliva of normal individuals, the percentage of the true pneumococcus type is not very large in the month of November; in December it increases enormously, to fall gradually to a low level in March and April.

One very important feature of the industrious research conducted by Dr. Leo Buerger at the Pathological Laboratory of Mt. Sinai Hospital, was the evidence it afforded of the communicability of the pneumococcus from one person to another. Patients may acquire the pneumococcus during their stay in the hospital wards, and this germ may remain in the mouth for a long time afterward. It is also found for varying periods of time in the mouths of patients that have recovered from pneumonia. Persons in whose mouth the pneumococcus has been repeatedly found to

be absent, may acquire the organism by association with pneumonia cases or with normal individuals in whom the pneumococcus is present. Living and virulent pneumococci are found in the handkerchiefs and dishes of pneumonia patients and "positive normal" cases, and on the lips of drinking cups and in the sputum floating on the surface of the so-called disinfectant liquid in the sputum cups. The author also found that seventy-nine per cent. of the pneumococci found in the mouths of normal persons are virulent. From this result one may reasonably conclude that the more general practice of a strict toilet of the buccal cavity will go far toward diminishing the prevalence of pneumonia.

The investigations of Professor Philip Hanson Hiss lead him to conclude as follows: "It seems more than probable that practically every individual, at least during the winter season, when exposed to environmental conditions such as those existing in New York City, acts as the host at some time or other, and probably at repeated intervals, of organisms of the true pneumococcus type." He also suggests that the pneumococci stand in etiological relation to some, at least, of the "common colds." A lesson of extremely practical import may be derived from these findings, namely, in view of the fact that the exciting bacterial sense of pneumonia is almost universally present in the normal mouth, the main hygienic precautions should be directed toward maintaining at par the general bodily health, thus minimizing the possibility of constitutional invasion. This, however, leads to the subject of the other etiological factors of pneumonia, with which it is hoped future researches will cope as ably as the present investigations have wrestled with the bacteriological aspect of the problem.

One of the important factors in the communicability of pneumonia is the dissemination of moist or dried sputum, either by means of the atmosphere or by means of articles of clothing. A careful study of the viability of the pneumococcus after drying was made by Professor F. C. Wood. He found that "in moist sputum kept in the dark at room temperatures the average life of the pneumococcus is eleven days, while in the same sputum kept at 0° C. the average life of the organism is thirty-five days. In dried sputum in the dark the pneumococcus lives on an average thirty-five days; in diffuse light, thirty days; and in sunlight, less than four hours. In powdered sputum even when kept in the dark

the death of the pneumococcus takes place in from one to four hours. When exposed to sunlight death occurs within an hour. Sprayed sputum particles remain in suspension for twenty-four hours. When sputum containing pneumococci is sprayed the organisms rarely survive for more than an hour, and often die in less time. The mucus of the sputum exerts a destructive action on the pneumococcus. Exposure of bacterial spray to sunlight while in suspension results in the destruction of the pneumococcus within half an hour." It is pointed out by Dr. Wood that inasmuch as moist sputum does not give off bacteria even when exposed to strong currents of air, it may be considered as innocuous except to persons handling clothes, bedding, etc., which have recently been contaminated. "The danger of infection from powdered sputum may be avoided by ample illumination and ventilation of the sick-room in order to destroy or dilute the bacteria, and by the avoidance of dry sweeping or dusting." It is also shown that the spray perish in from a few minutes to an hour pneumonia patient, may, if the ventilation of the room is good, be suspended in the air for a number of hours. The pneumococci present in the spray perish in from a few minutes to an hour and a half. "The risk of infection from the pneumococcus is largely confined to those in direct contact with the person whose excreta contain the organism."

We have quoted at length from the contribution of Professor Wood, for his results furnish a nice scientific demonstration of facts which have already been partly taken for granted. In contradistinction to the tubercle bacillus, it is to be noted that the process of drying diminishes the viability of the pneumococcus. The effects of sunlight and ample ventilation justify the modern recognition of these agents as valuable factors in the management of cases of pneumonia.

In surveying this valuable series of contributions to scientific medicine, it may be noted that while many of the facts revealed have already been suspected, a number of entirely new and unexpected phenomena have been discovered. Among these not the least important is the fact that the species pneumococcus includes a wide variety of organisms, each of which has a variable degree of virulence, and that bacteria which have hitherto been classified among the streptococci belong or are closely related to the pneumococci.

#### GILT-EDGED UNDERTAKING.

ONE of the most marked characteristics of the American mind is perhaps the narrowness of the line dividing pathos from bathos. The prompt ability to see the ludicrous element in any situation, no matter how gruesome or incongruous it may be, is all pervading.

With us it is but a short step from the sublime to the ridiculous and the professional humorist will readily extract more than sermons from the cold sepulchral stones while the reporter of hangings and lynchings is painfully apt to find good in everything. For the business and details of the undertaker's art have long been as fruitful a source of amusement to the American scribe of the higher class as the mother-in-law jest has been to the minor paragraphist who follows suit with the items of the advantage of flowers on the table and ice on the butter.

Of these writers Mark Twain has been perhaps the most prolific with his "Undertaker's Chat," "The Art of Inhumation" and the considerate undertaker with the rat in *Huckleberry Finn*. It was, however, Bret Harte who first struck the key-note, in 1879, of the advance in scientific undertaking, and foreshadowed the possibilities and results that were then only in their infancy. A prophecy that has not only been fulfilled, but which, according to M. Bertillon, of Paris, has been surpassed, for in Harte's time the "process" claimed no other merit than the ability to lighten the mourning heart and to cheer the drooping spirits of the bereaved. But we must remember that the telephone was long regarded as a toy, impossible of practical adaption, while the power of steam was considered as only of sufficient value to "raise the lid" of the kettle in the experimentor's brain.

The article in question was one of Harte's earlier publications and was entitled "Sleeping Car Experience." It consisted principally, as will be remembered, of a dialogue between two passengers, who, having boarded the train in the middle of the night, at a way-station, had taken seats in the one vacant section and were indulging in conversation in a languid, perfunctory sort of way. The remarks, which were evidently the continuation of what had been already said, were opened by the "One Man" with a feebly concealed yawn. "Yes! Well I reckon he was at one time as popular an undertaker as I knew."

The Other Man (feeling that it was incumbent upon him to say something), "But why was he popular as an undertaker?"

The One Man (lazily), "Well, he was kinder popular with widders and widdererers—sorter soothen 'em, a kinder keerless way; slung 'em suthin here and there, sometimes outer the Book, sometimes outer hisself, ez as a man of experience as hed hed sorrer."

The Other Man: "But how did he lose his popularity?"

The One Man: "Well that's the question. You see he interduced some things into undertaking that waz new. He had, for instance, a way, as he called it, of maniperlating the features of the deceased."

The Other Man (quietly): "How maniperlating?"

The One Man (struck with a bright, aggressive thought): "Look yer, did ye ever notiss how, generally speakin', onhandsome a corpse is?"

The Other Man had noticed this fact. "Yes, Sir," continued the One Man, "This yer undertaker, this Wilkins, had a way of correctin' all that. And just by maniperlation. He worked over the face of the deceased until he perduced what the survivin' relatives called a look or resignation—you know a sort of smile like. When he wanted to put in any extrys he perduced what he called—having regular charges for this kind of work—a Christian's hope."

The Other Man: "I want to know?"

"Yes; well I admit at times it was a little startlin', but it wazn't thet which made him onpopular."

The Other Man: "Well, what *did* make him onpopular?"

The One Man: "Extrys, I think. When Mrs. Widdecombe lost her husband she put up a big funeral for the deceased. She had Wilkins, and that undertaker just laid hisself out; just spread hisself. Onfort'nally—perhaps fort'nally in the ways of Providence—one of Widdecombe's old friends, a doctor up thar in Chicago, comes down to the funeral. He goes up with his friends to look at the deceased, smilin' a peaceful sort o' heavinly smile, and this yer friend turns round, short and sudden, on the widder settin' in the pew and kinder enjoyin', as wimen will, all the compliments paid the corpse, and he says, says he: 'What did you say your husband dies of, Marm?' 'Consumption,' she says, wiping her eyes, poor critter, 'Consumption—gallopin' consumption.'

"Consumption be d—d," sez he, being' a pro-

fane kind of Chicago doctor, and not bein' ever under conviction. 'A Christian's resignation be blowed. Hell is full of that kind of resignation. It's pizon. Thet man died of strychnine. Look at that face; look at that contortion of them fashal muscles. Thet's strychnine. Thet's *Riser's Sardonikus.*'"

Now, while we frankly admit that this early attempt to soothe the dull cold ear of death was not a complete and glittering success, yet we do claim that it was unquestionably the acorn from which the Bertillon oak has grown. In fact the situation resembles that of Dr. Oliver Wendell Holmes' lectures on physiology, when the galvanized leg of the frog refused to respond. "Gentlemen," the dear old autocrat was wont to say, "the experiment failed, but the principle remains the same." Then too, this matter of cosmetic effect is one of the things that they do better in France. Gaston's fingers are more adapted to the niceties of the "laying out" business than are those of Buffalo Bill, and in these matters Tennessee's partner cannot compete with Alphonse.

The Gallic adaptation, however, is yielding more practical results, according to the *Bulletin générale de Thérapeutique*, which gives an account of M. Bertillon's plan, lately adopted in Paris, of facilitating the identification of bodies by a modification of the ordinary photographic process. "Before the picture is taken a few drops of glycerin are injected with a Pravaz' syringe into the eyes of the corpse. After this, it is stated, the lids open and expression is restored to some resemblance of life itself. The glitter of the eyes, however, is still wanting. This is secured by a further injection into the sclerotic. This illusion is completed by rubbing the lips with carmine, and the body thus prepared is said to yield a *living portrait.*"

Alas, poor Yorick! A living portrait, with glistening eyes and carmined lips. A living portrait that only, perhaps, requires a further injection of glycerin into the abdominal muscles to yield on pressure the faint echo of "Papa" and "Mamma," and thus to complete the resurrection and the life.

#### MECHANICAL LAVAGE OF THE BLOOD.

WHILE the pharmacologists and the students of immunity are trying to discover, from their individual points of view, the substances with which to combat the various bodily infections, a simple and at first sight ludicrous method of

treating a certain class of intoxications has suggested itself to an ingenious French clinician.

M. Charles Répin (*Comptes Rendus de l'Acad. des Sciences*, July 24, 1905) has actually proposed the startling procedure of removing the blood from the body, and then, after treating this in a simple manner so as to remove its noxious qualities, to return it to the blood-vessels. The novelty of this form of therapeusis is fully equaled by the daring of its conception. If this proposition were not founded on a series of successful animal experiments, one would be justified in dismissing it as the flippant product of a riotous imagination. In fact, the results of these experiments are such as to warrant a careful consideration of this method of blood-renovation.

One year ago the author invented an instrument by means of which he could rapidly separate the red blood cells from the plasma, and then replacing the latter by a saline or nutritive solution, be able to return the new mixture to the blood stream. The essential part of this device is a centrifuge. Simply stated, the mode of conducting his experiments was as follows: A canula was inserted into the external jugular vein of the mammal experimented upon, and a certain quantity of blood allowed to flow into the mechanical separator. The blood was then quickly centrifuged, the plasma drawn off and replaced by a quantity of normal salt solution, isotonic with the blood, or of a solution of glucose or saccharose. The mixture of red blood cells and artificial solution was then returned through the canula, which had been left in place, to the interior of the vein.

It has been found that this process does not injure the red blood cells, for after the experiment no hemoglobinuria is observed. Definite quantities of the artificial substitute for the blood-plasma must be used. The isotonic solutions of glucose or saccharose are rendered alkaline by phosphate of soda (3 to 1,000). The amount of the artificial plasma added varies from 8 to 20 times the amount of blood that has been removed. If the proportion of blood is only one volume to eight or ten volumes of the diluting agent, then 2 or 3 parts per 1,000 of citrate of soda are added to prevent the formation of thrombi in the blood-vessels.

It is possible to thus remove one-fifth of the entire volume of blood from an animal without the production of ill effects. If this limit be exceeded dyspnea will occur. If this is slight it

will rapidly disappear if further removal of blood be stopped. If not, then the dyspnea increases and is followed by acute pulmonary edema. The cause of the latter is the diminished viscosity of the blood produced by the large amount of water injected. Watching the respiration it is possible to prevent these dangerous sequences by controlling the injection. Thus, in a goat the author was able to remove one-fourth of the plasma at one time. A few hours later the operation may be repeated without ill effects.

This unique procedure represents an up-to-date version or modification of the old-time practice of bleeding. There can be no doubt that in some cases this heroic remedy produced its good effects by diminishing the amount of toxins circulating in the body. In fact, venesection finds part of its modern justification in cases of gas poisoning, uremia, and other intoxications, in which it furnishes a ready means of removing a dangerous excess of toxic material from the blood. The chief danger, however, that results from bleeding is the reduction in the oxygen-carrying capacity of the blood, as shown by the air-hunger that follows induced or accidental hemorrhage. This disadvantage of venesection is obviated to a large degree by the return of the red blood cells uninjured to blood stream. The saline or nutritive solution serves not only to suspend the red blood cells, but also to maintain the normal fulness of the blood-vessels, and the normal osmotic relationships of the blood. The stimulant properties of the injected fluid must not be overlooked.

It is pointed out by M. Répin that "deplasmation," which is the name given to this scientific development of venesection, has absolutely no value for infections in which the poisons are fixed to the cells. Since this is the case with the greater number of intoxications, one can predicate only a restricted field of usefulness for this interesting form of therapeutics. It would seem to be indicated in those diseases in which the poison circulates freely in the blood, such as eclampsia and uremia. It remains for some bold clinician to test the actual curative value of "deplasmation."

**Mobile Free of Fever.**—Dr. Joseph Goldberger, of the Marine Hospital Service, who was sent to Mobile, Ala., by Surgeon-General Wyman to investigate the report that there was suspicious sickness there, has visited every house where a person is ill. He said on September 11 that there is not the slightest evidence of a case of suspicious fever.

## ECHOES AND NEWS.

### NEW YORK.

**Manhattan State Hospital Sports.**—An interesting and varied program of athletic sports, postponed from Labor Day, was given on September 9 by the patients and employees of Manhattan State Hospital, Ward's Island. It included baseball, swimming-race, foot-races of various kinds, tug-of-war, basketball, and a nail-driving contest. Music was furnished by the hospital orchestra, and refreshments were served.

**Fire in Rockefeller Research Institute.**—A recent fire in the laboratory of the Rockefeller Institute for Medical Research, which occupies a wing of the Nursery and Child's Hospital in Lexington Avenue, near Fiftieth Street, for a time seemed to imperil the lives of the mothers and babies in the hospital. Prompt action on the part of the firemen prevented serious damage. The fire was started by an oily concoction boiling over in the absence of a physician, who was reducing a mixture intended for use in the treatment of pneumonia.

**Antityphoid Campaign.**—Five hundred engineers from various parts of the country who are interested in water works gathered at the annual convention of the New England Water Works Association at the Murray Hill Hotel on Wednesday. The convention continued in session four days. A number of important papers on the use of copper sulphate to guard against typhoid fever epidemics, arising from unfiltered surface water supplies, were read. This new treatment of water supply has aroused much interest among water-works engineers. Dr. George T. Moore, of Washington, gave a general exposition of the problem. Then Prof. W. P. Mason, of Troy, described the uses of copper sulphate. The destruction of typhoid fever germs by copper sulphate was the theme of D. D. Jackson, of Brooklyn. Prof. Henry Kraemer, of Philadelphia, then gave his views on the germicidal properties of metallic copper. An erudite paper on how the sulphate behaves and what its uses are in purifying hard and turbid water was contributed by J. W. Ellms, of Cincinnati. G. A. Johnson, of Columbus, followed with some facts showing how the sulphate is applied. Other papers on the problem of vanquishing the typhoid fever germ by the use of copper were read, and a general discussion followed.

**The American Tuberculosis Exhibition.**—Arrangements are progressing favorably for the American Tuberculosis' Exhibition, to be held in New York, November 27 to December 9. Sanatoria and anti-tuberculosis societies in all parts of the United States will cooperate to make the affair a success, and it is expected that a large part of the material from the French Exposition, to be held in Paris in October in connection with the International Congress of Tuberculosis, will be shipped to New York for the American exhibition. The committee of arrangements is also planning a series of conferences on special phases of the tuberculosis problem, which will be open to the public and will be of popular interest and value. Recent developments of note in the antituberculosis campaign are the organization of State associations to fight the disease in Iowa and Kentucky. The Iowa Association for the Study and Prevention of Tuberculosis was formed at a meeting called for the purpose at Des Moines, on July 27, and attended by representative physicians and laymen from all parts of the State. The new society

is in the hands of a strong board of directors, with ex-Governor William Larrabee as president and Dr. E. Luther Stevens, Des Moines, as secretary. The Kentucky Antituberculosis Association, also recently organized, has its headquarters in Louisville, with W. C. Nones as president and George L. Schon as secretary.

### PHILADELPHIA.

**Enteric Epidemic at Nanticoke.**—Typhoid fever has made its appearance in the small mining town Nanticoke, near Wilkesbarre, Pa. In the space of a very short time more than one hundred cases occurred and so rapid has been its spread that the opening of the public schools has been postponed. The source of the water supply is from a mountain lake.

**Typhoid Fever Not Yet Eradicated.**—There were but five wards from which cases of enteric fever were not reported last week; each of these wards is supplied entirely with filtered water, a fact that lead the health authorities to believe that those cases reported from wards receiving filtered water are imported from summer resorts or elsewhere, and are not to be credited to the city water. Last week 125 cases were reported in contrast to 62 the preceding week.

**Still on the Look-out for Yellow Fever.**—Last Wednesday the American steamship Shawmut arrived at Reedy Island Quarantine Station, having on board a sick sailor whose condition aroused the suspicion of the authorities and caused the vessel to be detained. While the physicians were not inclined to diagnose the case as yellow fever they saw in it some evidences of that disease. The crew was placed in quarantine, the vessel fumigated and then sent to its destination.

**Scopolamine as an Anesthetic.**—Surgeons of this city have recently turned their attention to the study of scopolamine, but instead of using the drug to quiet patients suffering from delirium tremens or the delirium of the acute infectious diseases as reported by Liepolt (*Berlin. klin. Woch.*, No. 15, 1904) they have injected the drug hypodermatically for the relief of pain produced by operation. Dr. Orville Horwitz did a Bottini operation on a man seventy-three years old at the St. Agnes's Hospital after injecting 0.1 mg. of the drug with the addition of 25 mg. of morphine into the patient's arm. The man remained quiet for two hours and then awoke without nausea or vomiting. Dr. A. C. Wood has been making similar experiments at the Philadelphia Hospital.

**School Teachers Must Obey the Health Law.**—In order that this may be accomplished Dr. Dixon writes to the principals as follows: "Your attention is respectfully called to section 12 of the act of Assembly of June 18, 1895, which declares that 'all principals or other persons in charge of schools as aforesaid (namely, public, private, parochial, Sunday or other schools) are hereby required to refuse the admission of any child to the schools under their charge or supervision, except upon a certificate signed by a physician, setting forth that such child has been successfully vaccinated, or that it has previously had smallpox.' Section 21 of the same act provides that the penalty for failure, neglect or refusal to comply with or violation of this requirement shall, for every such offense, upon conviction thereof before any mayor, burgess, alderman, police magistrate or justice of the peace, pay a fine or penalty of not less than \$5 or more than \$100, and in de-

fault of payment thereof be imprisoned in the county jail for a period not exceeding sixty days. I beg you to observe that in this matter the principal or teacher is responsible, not to the school directors, but to the health authorities of the state or the municipality, and that no action of the school directors can supersede the requirements of the law. Any attempt to shift the responsibility onto the shoulders of the directors would therefore be attended by serious risk. I do not allow myself to doubt, however, that your own intelligent appreciation of the importance of the strict enforcement of this law, both for the protection of the health of the children under your care, as well as of that of the entire community, and for the avoidance of the serious interference with education which such an outbreak of smallpox in a community always involves, will make further reference to penalties entirely unnecessary."

To the secretaries of the Board of Health Dr. Dixon sent the following: "Allow me respectfully to call your attention to the fact that section 13 of the act of June 18, 1895, requires that 'the health authorities of all municipalities shall furnish to principals or other persons in charge of public, private, parochial, Sunday or other schools, and to physicians, the necessary certificates or blanks for the uses and purposes' as set forth as required in section 12 of said act, which section reads as follows: 'All principals or other persons in charge of schools as aforesaid are hereby required to refuse the admission of any child to the schools under their charge or supervision, except upon a certificate signed by a physician setting forth that such child has been successfully vaccinated, or that it has previously had smallpox.' Section 13 provides in addition that 'the registry of said schools shall exhibit the names and residences of all children or persons admitted or rejected for reasons set forth in this act, and said registry shall be open at all times to the inspection of the health authorities.' In view of the above-recited requirements, and the near approach of the opening of schools, I would suggest the importance of at once making inquiry in order to discover whether the principals or other persons in charge of all schools (public, private, parochial, Sunday or other schools), and all physicians within your jurisdiction, have been thus supplied with the necessary certificates, blanks or registries as required by law. It will be the duty of your board to supply any deficiencies in this respect. It will also be its duty to notify each principal or teacher, as the case may be, formally and in writing, at least one week before the opening of the schools, of the requirements of the law and the penalties for its neglect or violation."

#### CHICAGO.

**Additional Ground for Illinois Infirmary.**—The Illinois Charitable Eye and Ear Infirmary have acquired 100 feet additional frontage on Peoria Street, just north of Adams Street, for \$20,000, on which to build a modern fireproof addition to its present building.

**Guilty of Illegal Practice.**—For practising medicine without a license, John Pattie, of Peoria, was recently found guilty and fined \$100 and costs. Pattie has appealed from the decision of the court, and claims that he practised under the special direction of a licensed physician.

**Washington Park Hospital.**—The cornerstone of this hospital, located at 6010-6012 Vincennes Avenue, was laid September 4, and distinguished Swedish physicians took part in the ceremonies. The struc-

ture will be three stories high, 125 by 44 feet, and will have a capacity of 75 beds. The cost is to be \$50,000. It will be ready for occupancy next January, and with the present buildings will have a total capacity of 105 beds.

**New Hospital for Canton, Ill.**—The Misses Graham, of Washington, D. C., who were formerly residents of Canton, propose to furnish the necessary grounds and to erect a public hospital building thereon at Canton, to cost \$15,000, and containing about twenty rooms, under the condition that an endowment of \$20,000 shall be provided, that the hospital shall be free to all schools of medicine, and that at least five rooms shall be available for charity patients.

**Tuberculosis Death Rate Decreasing at Dunning.**—The death rate among tuberculous patients at the Dunning institutions has decreased 15.31 per cent. since they have been removed to the new consumptive hospital. Superintendent Podstata, in a report submitted to the County Board, recently said this result was due to the surroundings at the new hospital, which is considered a model of its kind, with plenty of fresh air and light. During March, April, May, June, July and August of last year the death rate of tuberculous patients was 42.52 per cent. During the corresponding months this year the death rate is 27.21 per cent. Superintendent Podstata recommends that a small separate ward be constructed for the care of the patients who are helplessly afflicted with tuberculosis.

**Notice to Illinois Embalmers.**—Secretary Egan, of the Illinois State Board of Health, has issued a notice to Illinois embalmers to the effect that under the provisions of the act approved May 13, 1905, no person shall embalm, or prepare for transportation, any body dead of a contagious or infectious disease, or embalm any dead body, or hold himself out as practising the art of embalming, unless he holds a license from the State Board of Health authorizing him so to do. After September 1, 1905, no transportation company operating in the State of Illinois will accept a body dead of any contagious or infectious disease, unless it has been prepared by an embalmer holding a license issued by the State Board of Health. After January 1, 1906, any person who shall embalm, or prepare for transportation, any body dead of a contagious or infectious disease, or embalm any body, or hold himself out as practising the art of embalming without having obtained a license from the State Board of Health, shall be deemed guilty of a misdemeanor.

#### CANADA.

**The Canadian Medical Association.**—The thirty-eighth annual meeting of the Canadian Medical Association was held in Halifax, N. S., August 22 to 25, under the presidency of Dr. John Stewart, Halifax, the general secretary being Dr. George Elliott, Toronto. It was the third largest meeting in the history of the association so far as actual attendance from the Canadian profession was concerned, and more than quadrupled the attendance at the former meeting, held in that city in 1881. Among those who attended was the Hon. Dr. Parker, of Halifax, the second president of the association, and there were but two others present who had been in attendance in 1881. In that year the farthest point from which a member traveled was London, Ontario; this year there were some from British Columbia. The formal opening took place on August 22, when the Reverend President Forrest, of Dalhousie University, opened the proceedings with prayer. Following him His Honor, the Lieutenant-Governor of Nova Scotia, welcomed the visiting delegates in the

name of the Province Down by the Sea. Then the Mayor of Halifax extended a welcome on behalf of the corporation of that city, and following His Worship, the president of the Medical Society of Nova Scotia, Dr. H. A. March, of Bridgewater, read an address on behalf of that society, which acted as hosts.

Dr. John Stewart then read the annual presidential address, after which Dr. D. A. Campbell, of Halifax, read the Address in Medicine, taking for his subject the history of the medical profession in Nova Scotia. The Address in Surgery was delivered the following day by Mr. Francis Caird, of Edinburgh, and in the afternoon of the same day Dr. J. W. Stirling, of Montreal, read the Address in Ophthalmology. On the evening of the next day Dr. Howard A. Kelly, of Baltimore, read the Address in Gynecology, his subject being cystitis in women. Following that were two lantern demonstrations of much interest, the first conducted by Dr. J. M. Elder, of Montreal, in the absence of Dr. J. Alex. Hutchinson, Montreal, on fractures as shown by radiographs; the second by Professor J. J. McKenzie, of Toronto University, on recent studies on the elastic elements of the aortic wall in relation to arteriosclerosis. On the morning of the last day a general discussion took place on obstetrics, the particular subject being "The Management of the Puerperal State." This was opened by Dr. Thomas Walker, of St. John, N. B., continued by Dr. H. L. Reddy, Montreal, and participated in by Dr. Albert A. Macdonald, Toronto; Dr. F. R. Eccles, London, Ontario; Dr. M. A. Curry, Halifax; and Dr. D. McIntosh, Pugwash. This proved an interesting feature of the meeting.

**Reorganization of the Association.**—The most important item of business considered was that of reorganization of the association on the lines of the British Medical and American Medical Associations. This led to the appointment of a special committee, consisting of one member from each province, with Dr. Alexander McPhedran, of Toronto, as chairman. This committee made an interim report before the close of the meeting and was continued. In the intervening time before the next annual meeting suggestions will be asked from the members of the association in the various provinces. The Committee on Public Health, appointed two years ago, was discharged and a new and larger committee appointed in its stead. The convener of this committee is Dr. E. P. Lachapelle, of Montreal, an advanced sanitarian. It was decided to meet in Toronto in 1906 at the same time as the meeting of the British Medical Association.

**Election of Officers.**—The following were the officers elected for the ensuing year: President Dr. Alexander McPhedran, Toronto; vice-presidents—Prince Edward Island, Dr. H. D. Johnson, Charlottetown; Nova Scotia, Dr. G. Carleton Jones, Halifax; New Brunswick, Dr. Emery, St. John; Quebec, Dr. H. S. Birkett, Montreal; Ontario, Dr. J. D. Courtenay, Ottawa; Manitoba, Dr. S. P. Prowse, Winnipeg; Northwest Territories, Dr. H. G. McKid, Calgary; British Columbia, Dr. R. E. McKechnie, Vancouver. Local secretaries: Prince Edward Island, Dr. Simpson, New Glasgow; Nova Scotia, Dr. J. R. Corston, Halifax; New Brunswick, Dr. J. A. Scammell, St. John; Quebec, Dr. Ridley McKenzie, Montreal; Ontario, Dr. Harold Parsons, Toronto; Manitoba, Dr. J. R. Davidson, Winnipeg; Northwest Territories, Dr. J. Hislop, Edmonton; British Columbia, Dr. W. H. Sutherland, Revelstoke. General secretary, Dr. George Elliott, Toronto; treasurer, Dr. H. Beaumont Small, Ottawa; executive council, Drs. W. P. Caven, Albert A. Macdonald and F. LeM. Grasset, Toronto.

## GENERAL.

**No Plague Cases on the Isthmus.**—There have been no further developments regarding the supposed presence of the bubonic plague on the Isthmus. The quarantine has been entirely raised. The sanitary conditions of the Isthmus are comparatively good. There is no yellow fever in the city of Panama.

**Official Cholera Bulletin.**—An official bulletin issued in Berlin on September 11, says, that 16 cholera cases and 6 deaths were reported from noon, September 9, to noon, September 10, and 15 cases and 6 deaths from noon, September 10, to noon September 11, making the totals 170 cases and 58 deaths.

**Russia Not Responsible.**—The Government at St. Petersburg reiterates, officially, that the outbreak of cholera did not originate in Russia, as the raftsmen among whom the disease was first discovered, although they came down the Vistula, had been in Germany a fortnight before they became sick, whereas ten days is the period of inception for cholera.

**Bites at Night.**—At the beginning of the campaign in New Orleans it was stated by the official fever fighters that the stegomyia was to be feared principally during the hours of daylight, biting seldom at night. Health Officer Khonk, however, made this important statement recently: "The stegomyia is a day mosquito, but it has been discovered that shortly after the twelve days' infection it also becomes a night mosquito and bites at night. We did not know this until very recently."

**Canal Officials Return.**—A number of Panama Canal officials on leave of absence recently arrived in New York on the steamship Mexico. Mr. Benson, auditor of the Canal Commission, said that malaria was more of a cause for worry on the Isthmus than yellow fever. When the Mexico left Colon on September 5 there were but four cases of the fever there. Ten passengers and seven of the crew were found to have abnormal temperatures, and were removed at Quarantine for observation.

**Friction in Fever Fight.**—Lack of faith on the part of some of the authorities in the mosquito as the only transmitter of yellow fever is given as one of the causes of the controversy which has resulted in Dr. Tichenor's withdrawal from Tallulah, La., whether he had been sent by the State Board of Health to take charge of the situation. Until Dr. Tichenor reached Tallulah no one had any idea of the extent of the disease there. Dr. Tichenor at the end of his investigation telegraphed that the whole town was infected, that the situation was exceedingly serious, and that help was needed. The new cases and deaths since have borne out his first telegrams. Dr. Tichenor immediately proceeded to apply the mosquito theory rigidly, but found that some of those in authority did not altogether believe in it, with the result that friction resulted, and he asked to be relieved. Efforts are being made now to send Dr. Ezdorf to Tallulah.

**The Last Battle of a Hundred Years.**—The Rev. Beverly Warner, of New Orleans, in a recent issue of *Charities*, writes: "We are not concerning ourselves much these days with questions as to how the fever came in, or trying to shift responsibilities. We are fighting what we believe to be the last battle of a hundred years' war. It is the profound conviction of the health authorities, federal and local, that New Orleans need never again fear an epidemic. When the last case has passed into history, we expect to have proved that the fever is no longer a mysterious enemy, coming from an unknown quarter, and striking in the dark—but an open and well-known foe, against whom we may

always be on guard, and with which we have a certain knowledge of being able to cope. Under the sane and experienced leadership of the Marine Hospital Service, we are fighting at our own cost and charges in men and money. And we expect to win." This expectation is being realized, for at present the fever is spreading only among smaller towns, where the enthusiasm and system of the New Orleans campaign is wanting.

**The Progress of Cholera in Germany.**—The latest reports from Germany are to the effect that cholera has scattered itself over 32,000 square miles. The district extends from the River Oder northwestward to the Russian border, about two hundred and fifty miles, and from Danzig to Grozisko, south of Posen 150 miles. All this shows not only how difficult it is to guard against the inroads of an infectious disease in more or less densely populated regions, where intercommunication is so varied and intricate, but how impossible it is to educate the people generally in the necessary means for their own safety. The local health authorities are, however, meeting the issues in a valiant and thorough manner.

#### OBITUARY.

**DR. THOMAS MENEES**, one of the best known physicians in the South, is dead at his home in Nashville, Tenn., at the age of eighty-three years. Dr. Menees was a member of the Confederate Congress and had been a professor in several Southern colleges.

**DR. JAMES LAWS**, for many years a surgeon in the navy and for a time fleet surgeon under Admiral Porter, died at Washington, D. C., September 13, aged seventy-eight years. He was born in Philadelphia, was graduated from Jefferson Medical College and entered the navy as a surgeon. He was chief surgeon of the Kane Arctic relief expedition, and received from Queen Victoria a decoration for his services. After the close of the Civil War he resumed the practice of his profession in Philadelphia until 1883, since when he had been an examining surgeon in the Pension Bureau at Washington.

#### SOCIETY PROCEEDINGS.

##### HARVARD MEDICAL SOCIETY OF NEW YORK CITY.

*Regular Monthly Meeting, held May 27, 1905.*  
The President, Charles G. Schram, M.D., in the Chair.

**Tendon Transplantation for Deltoid Paralysis.**—Dr. Royal Whitman presented a patient six years old who had been a sufferer from complete paralysis of the deltoid. As a consequence of this the humerus hung down out of the socket at the shoulder-joint, and the arm swung absolutely helpless and flail-like. The deformity was corrected by the transplantation of a portion of the trapezius muscle along the shaft of the humerus inserted into the deltoid. When the operation was done the arm was put in an elevated position, the muscle fibers being drawn taut and then was gradually brought downward at intervals afterward until it came to the side of the body. Now the little patient can swing her left arm and put it up above her head, and considers that she can use it as well as other people. As a matter of fact, however, there is very little power in it, but the child has learned to use other muscles in such a way as to help out whatever of power was gained by the transplantation of the trapezius.

**Stimulation of Effort.**—In these cases before operation as the result of the palsy, children cannot be

brought to exercise any effort and so cannot be trained to use whatever little of muscular power they possess. After the transplantation it is necessary to bring training into effect, so as to encourage the use of all the muscles in the neighborhood. While this was impossible before, it is usually not difficult after operation. The palsy in this case was due to an anterior poliomyelitis, which affected the child at the age of about two and a half years and left the deltoid completely paralytic. The fibers of the trapezius were fastened to the atrophied deltoid by strong silk sutures of braided silk, which were allowed to remain in place, and have given no difficulty, as they do not in cases where asepsis has been complete.

**Echinococcus of Liver.**—Dr. Henry C. Coe presented an echinococcus cyst of the liver which had been removed from a patient operated upon for the relief of symptoms pointing to the kidneys. There had been no suspicion of the presence of the cyst until after the opening of the abdominal cavity, and the exploration of the liver region.

**Amenorrhea and General Diseases.**—Dr. Coe read a paper on the association of amenorrhea with chronic disease. He called attention to the fact that while absence of menstruation, especially after it had once been established, is usually attributed to some affection of the genital organs, not infrequently it is really due to some chronic systemic disease. He has recently had under observation several cases of amenorrhea which ultimately proved to be acromegaly, a disease that is very difficult of diagnosis in early stages. These cases called his attention to the fact that not infrequently diseases of the ductless glands are associated with disturbances of menstruation and usually in the direction of lessening the amount of menstrual flow. The thyroid gland has been of interest to gynecologists for various reasons, but it is evident that the other ductless glands must also be considered because of their effect upon symptoms that come to the gynecologist for treatment.

**Illustrative Cases.**—One of the first cases was that of a young woman, aged twenty-five years, who suffered from amenorrhea for a considerable period, after having begun to take on flesh. She was married, and it was the sterility of the marriage that brought her to the physician. In this case some marked atrophic changes were found in the uterus, though there had been no hot flushes and no other symptoms of a precocious nature. The taking on of weight recalled somewhat the similar occurrence after castration. In this case thyroid extract was given, which at times proves helpful, though most of the cases are not relieved by it. Some of these patients continue in good health, after their amenorrhea has set in, but many of them decline in health or show symptoms of some constitutional disease.

**Acromegaly.**—A young woman who presented a marked tendency to adiposity, but with no previous menstrual signs and no local changes in the uterus, began to suffer from scanty and then absent menstruation. Thyroid extract was given, and the faradic current was applied to the thyroid glands, but without effect. In a careful examination made under an anesthesia no cause for the menstrual condition could be found. A year later the coarseness of features and the enlargement of the extremities so characteristic of acromegaly became manifest, and the patient suffered from the intense headache and some of the eye symptoms that indicated the

presence of brain tumor. There was no doubt that the original amenorrhea and tendency to accumulation of adipose tissue was a primary symptom of the affection of the hypophyseal gland.

**Adiposity and Coarse Features.**—A young girl, aged eighteen years, came under observation not long since, gave a history of having had no menstruation for nearly a year. During this time she had gained much weight, and now weighed two hundred pounds. She had always been stout, but there had been a marked increase in the tendency since the absence of menstruation asserted itself. She already presented the coarseness of features that were suggestive of beginning acromegaly. Besides, there was considerable mental sluggishness, though as yet no complaint of headache. A bimanual examination made per rectum showed the presence of a small uterus, but no pathological condition. The administration of thyroid extract did not help the patient, and the acromegalic tendencies have continued. The frequency with which such cases present themselves for treatment for sterility is rather remarkable, and it is evident that if patients' cases are to be properly understood, there must be a careful review of the history, with the idea of recognizing the possible presence of any affection of the ductless gland.

**Curettetment and Non-menstruation.**—In certain patients the endometrium seems to have a much lessened activity as regards its reproductive powers than in others. In two cases Dr. Coe has seen complete failure of menstruation follow curettetment. It is evident that careful precautions must be taken not to allow some of these general diseases that are already beginning to lessen the menstrual flow, to be an unrecognized factor in these cases. In patients in whom the cause for the amenorrhea seems without doubt to be due to some defect of the ductless glands, the administration of these substances does not always or indeed usually prove of much service. Dr. Coe has tried extracts of pituitary and submammary glands both without success. In Hodgkin's disease it is the usual rule for the patient to suffer from scanty menstruation and then, in the course of the disease, to have menstruation stop entirely. Usually any treatment that brings about any amelioration of the Hodgkin's disease will also restore the menstruation; but the outlook is very unfavorable.

**Pituitary Therapeutics.**—Dr. Howard Lilienthal said, in discussing Dr. Coe's paper, that the use of extract of the pituitary body could not be expected to do any good in acromegaly, since the disease was really due to an enlargement of the hypophyseal gland, and this enlargement was usually malignant. Too much of the specific substance is already finding its way into the circulation, and the addition of further material of the same kind from without would, if possible, only add to the symptoms. Dr. Lilienthal said that Kocher, of Berne, in studying the cases of myxedema consequent upon the ablation of the whole thyroid, which produced the so-called cachexia strumipriva, noticed that amenorrhea was among the first symptoms.

**Antagonism of Thyroid and Ovary.**—Dr. Coe said, in closing the discussion, there seems to be no doubt now in the minds of physiologists and gynecologists that there is a distinct antagonism between the thyroid and the ovary. By this, of course, is meant that the internal secretion of the ovary which undoubtedly exists, has some action opposite to that of the secretion produced by the thyroid. It is not an un-

usual thing to find an increase in size of the thyroid, during menstruation. An enlargement of this gland during pregnancy is almost the rule. In these cases of absent menstruation, the thyroid is sometimes diminished in size, but sometimes it is unaffected. Undoubtedly there is some close relationship between these structures, and yet extract of thyroid fails to be of service in many cases.

**Gunshot Wound of the Abdomen.**—Dr. George T. Chase reported a case of gunshot wound of the abdomen, with perforation of the stomach and intestines, treated by operation, and followed by cure. The patient was a woman of twenty-nine years, married, who during a drunken debauch shot herself with a revolver of small caliber at 3 A.M. She was taken at once to the Hood Wright Hospital, where Dr. Chase saw her about 5 A.M. She was suffering from moderate shock, and the wound of entrance of the bullet was on the left side, just below the costal cartilages, while the wound of exit was on the opposite side, somewhat posteriorly, so that the bullet has passed straight through the upper abdomen. There was no vomiting, and no urinal disturbance. It was deemed advisable, however, to operate, and the penetrating wounds of the hollow viscera, which were found, showed the propriety of this.

**Injured Viscera.**—The bullet had penetrated the stomach anteriorly and passed out posteriorly. It had penetrated the descending colon and also the right kidney. The wound in the kidney was through the substance of the organ and not the pelvis. Notwithstanding the presence of these wounds, the contents of the intestinal tract were not found in the peritoneal cavity. After the wounds had been tied up, the kidney wound was flushed out with saline solution, and drainage inserted in this neighborhood. Pneumonia developed on the seventh day, and yet the patient recovered from it. Urine flowed for some time from the posterior wound, but gradually this ceased, and now the patient seems entirely well. One of the important elements in the favorable termination of this case was undoubtedly the fact that the woman like all suicides, wanted very much to get well. The favorable points in the case besides this were the smallness of the projectile, which was probably not more than 22-caliber, the lack of delay before the operation was performed and the excellent physical condition of the patient apart from her drunkenness.

**Size of Projectile.**—Dr. Howard Lilienthal said that there are two things that make gunshot wounds especially favorable. If the projectile is small, little damage is done and even perforating wounds will sometimes not leak. The old-fashioned bulldog revolver with a smooth bore made a more ragged wound and was more likely to be followed by septic conditions than the rifled arms of more modern days. If the colon is full then there is danger of perforation. Had the stomach been full on this occasion the patient would surely have run a greater risk. The absence of food in the stomach and intestines is what seems to account for the better results in abdominal wounds of colored patients than in white patients. Colored folks are not quarrelsome as a rule when they have had enough to eat. It is when starving that they are more likely to get into deadly quarrels.

The rule for operation in perforating wounds of the abdomen in civil life is that where circumstances are favorable, and the patient is seen not long after the accident, operation should be performed. In war, however, owing to the lack of facilities for aseptic operation, the opposite rule holds. The percentage

of recovery in war times is not so good in operated cases with the high power of explosive and small-caliber bullets.

**Non-Operative Recovery.**—Dr. Henry C. Coe said that during his first year of practice he was called to see a severe case of revolver wound of the abdomen, in which the ball had penetrated the abdominal cavity. The patient was a cousin, college graduate and athlete, who was disturbed by finding a burglar in the house. He got up and grappled with him and the burglar held a revolver of 45-caliber against his abdomen and fired. The shock was not enough to prostrate the patient at once, and he succeeded in preventing the burglar from firing again. The incident took place in the country and a country physician was called, had the good judgment not to probe the wound, but simply sealed the anterior wound and allowed the posterior to remain open. No peritonitis resulted and at no time was there any pain. There was some extravasation of urine through the posterior wound showing that, as in Dr. Chases' case, the kidney had been wounded. There was no rise of temperature, however, and the patient proceeded to make an uninterrupted recovery, evidently due to his strong and healthy constitution. The wound was inflicted in the early morning hours, when the viscera were empty, and this seems to have been the other favorable factor. For sometime subsequently he suffered from pyelitis, but was able to continue his athletic exercises though in cold weather there was discomfort in that kidney. Some years later he was able to pass a medical examination for insurance, and now there seems no doubt that he has entirely recovered from the effects of the wound.

**Pushing Aside of Tissues.**—The most interesting thing with regard to bullet wounds made by the larger projectiles is that occasionally when they are slow going, they push the hollow viscera aside or fail to wound veins or arteries because these yield and allow them to pass. Dr. Lilienthal recently saw a case in which a revolver wound was inflicted just below the eye, and the ball entering a very short distance below the orbit, passed out just behind the mastoid, and yet, in spite of all the important structures that lay in its path, it seemed to have been perfectly direct, not a single one of them was hurt.

**Nephrolithiasis.**—Dr. Howard Lilienthal read a paper describing some experiences with kidney calculi. The first case was that of a young man of thirty-two years, who had the usual characteristic symptoms of renal colic followed by profuse hematuria. He suffered for an hour before being seen and passed almost pure blood. After a hot bath and perfect rest for some hours, the pain quieted down and he was able to be about the next day. Large quantities of water were advised and a favorable prognosis was given. The patient was directed to take four quarts of water between meals. Over a year later a stone was passed and the patient has been perfectly well ever since. In this case some pyelonephritis developed, causing the presence of albumin in the urine. For a time this prevented the patient from taking out insurance, but subsequently the condition improved, and all the symptoms disappeared. This is now several years ago, and there has been no further complaint. A second case occurred in an older man of sixty-three years, who had his first attack at this age. He was treated just as was the first one, and after drinking plentifully of water for some months, passed a stone, since when

there has been no further trouble. In the third case the patient was admitted to Mt. Sinai Hospital with the diagnosis, typhoid fever. There was a marked leucocytosis present, and no Widal reaction could be found. There was some local tenderness in the right iliac region, but all the urine contained red blood cells, and the right kidney was larger than normal. The X-rays were employed, but no stone could be found. After a time an abscess pointed in the flank and was opened with the evacuation of pure pus. For a time this was thought to be a subphrenic abscess from an old appendicitis, but after a time urine came from the wound, and it was evident that the kidney was involved. The wound healed after a time, but later there occurred exacerbations of symptoms, when the temperature rose to 105° F. This patient also was treated with large quantities of water and after a time the sinus closed.

**Fallibility of X-Rays.**—In a subsequent case a young man of thirty-one years, who had suffered from characteristic renal colic four times, each attack being more serious than the previous one, and each followed by blood in the urine. A careful X-ray examination failed to disclose any hint of the presence of stone. He too was placed on the water regime, and after a time he passed several stones. Phosphatic stones are easiest affected by the water treatment. In general it may be said when only one or two attacks of renal colic have occurred it is always well to give this method of treatment a thorough trial. When many stones are present Dr. Lilienthal considers that it is more advisable to remove the kidney entirely than to do a nephrotomy.

**Reflex Anuria.**—In a certain number of cases almost any manipulation of the urinary tract in certain sensitive individuals may lead to complete stoppage of the urine. In one case under Dr. Lilienthal's care, the patient was a bad subject because of cardiac and asthmatic complications. As the result of an examination by the uretroscope, complete anuria occurred, and lasted for forty-eight hours, after which the anuria disappeared and was followed by a free flow of urine. Unfortunately a pneumonia subsequently developed and the patient died. In another case where the patient complained of a dull pain in the right flank and there was a distinct tenderness in the right hypochondrium, many stones were removed from the right kidney, but for several hours afterward not a drop of urine was passed. This condition passed off after a time, however, and is evidently one of reflex anuria, though of course the thought that there might be no other kidney present proved a source of worry.

**Indications for Operation.**—When the stone is very large or when there have been repeated attacks of renal colic, operation is indicated. Otherwise water diuresis should be employed, a quart of water being taken at a sitting within fifteen minutes. This should be repeated four times a day. Whenever pyonephrosis is present operation is indicated. Reflex anuria has been denied and the symptoms attributed to it have been said to be uremic. There is no doubt however that complete anuria from nervous reflex can occur. There is no need of haste in the treatment of the condition, as such patients will live from seven to ten days, even though they are not passing a single drop of urine. Life endured for eight days in the patient from whom the solitary kidney was removed, and true uremia did not develop. After a time there was nausea, and the patient became edematous but there was no convulsions. Various

methods of treatment then may be tried before operation need be considered necessary.

**Inversion of Patient.**—Dr. Cabot stated that following Dr. Lilienthal's suggestion, he has found that if patients are advised to lie down as far as possible in an inverted posture the hips and legs being much higher than the body the attacks of renal colic may be brought to an end. Subsequently, under the water treatment, such stones may be passed absolutely without pain. In one case in Dr. Cabot's experience this was true, and the only warning the patient had of the passage of the stone was its dropping in the water-closet, whence it was recovered. Dr. Cabot has kept kidney calculi for a year in piperazine solution, but without effect. He considers that reflex anuria from manipulation of the bladder may readily occur and he has seen it last for many hours. The rule, however, is that it passes off without any special treatment.

**Hysterical Renal Colic.**—Dr. Coe said that it must not be forgotten that in certain highly neurotic women attacks closely resembling renal colic may develop. Some years ago he was called to see a young woman who seemed to be suffering from typical renal colic. Morphine did no good, and chloroform had to be employed for her attacks, several of which occurred. The urine was very scanty and it was considered that a calculus would surely be found. Two of the best surgeons in the city were called in consultation and the kidney was opened, but no trace of a stone could be discovered. There was a rather stormy convalescence, in which the pulse would frequently rise to 140 and the family usually in the night would be summoned to her bedside for a dying scene. Two weeks after the first operation there was a typical attack of renal colic apparently on the other side. Dr. Coe immediately used ether in order to overcome the pain and made the remark that this was what he should have to do every time the attack returned. There was no further occasion to resort to the etherization.

Dr. Coe said that X-ray pictures are apt to be misleading in some cases and always require to be done by an expert and all their features carefully analyzed. He knows of a case in which even a bullet was thought to be present in the X-ray photograph and yet proved not to be where located.

Dr. Lilienthal said that on several occasions in his experience the X-rays have suggested a false diagnosis. In one case there was a distinct shadow present which was thought to be a stone in the ureter. Later examination by an expert in the use of the X-rays led to the report that this apparent stone was really a sesamoid bone, in the obturator muscle. In a member of the house staff who was suffering from renal colic, having every day two attacks, there seemed to be at least three stones present. Later, however, this was demonstrated to be a mistake, and none was found.

**Liver in Uremia.**—In many cases of uremia the liver is affected as well as the kidneys. In fact, the modern explanations of uremia nearly always include a reference to degenerative conditions of the liver. In anuria it occurs after kidney operations. Not infrequently affections of the liver are found to be present and it is this rather than the operative intervention in the urinary tract that leads to the serious result. In the light of this close association of hepatic and renal lesions it becomes advisable to estimate the condition of the liver before operating upon the kidney.

#### JOHNS HOPKINS HOSPITAL MEDICAL SOCIETY.

*Regular Meeting held April 17, 1905.*

The meeting was devoted to comparative surgery, a report being made of the work done in the course in operative surgery on animals by the third-year class of the Johns Hopkins Medical School. Dr. Cushing, by way of introduction, emphasized the importance of building up a veterinary hospital in connection with surgical teaching—not only for the teaching purposes proper, but also by way of disarming the criticism, perhaps a just one, which was made against the reckless use of material involved in allowing students to operate on healthy animals. Operative surgery was usually taught by work on the cadaver; it was therefore confined to operations on the extremity and ligation of arteries. But the absolutely essential instinct to surgical cleanliness, the ability to handle living tissues, skill in controlling hemorrhage—these things could not be learned from a cadaver. Nor was it possible to teach or to learn visceral surgery in this way.

When the course in animal surgery at the medical school was started, operations were done for hypothetical lesions. The material was not then necessarily wasted, but could often be used in one of the laboratories; a gastrotonized dog, for instance, furnished the physiologist with gastric juice for study, and so forth. Nevertheless this method involved needless operation; and criticism of this feature only began to be disarmed when animals were brought in with lesions which needed treatment. For the future, then, the plan is to build up a veterinary hospital so that animals may receive necessary surgical attention and students may receive useful surgical instruction at the same time.

**Hemorrhagic Cysts of the Thyroid.**—Mr. Faris reported two cases of this condition occurring in dogs. The first was in an Irish setter. It had caused interference with respiration, and cure was effected by its removal. The second occurred in a hound, was associated with bad temper, muscular twitching, loss of hair, increase in weight and dryness of skin. No exophthalmos was present. The cyst was removed, but without much improvement in the dog's condition. Both tumors proved to be thick-walled cysts, containing dark red, grumous material made up of shadows of red blood cells and cholesterol. The pathology of the thyroid in dogs was said to be similar to that in man. Hemorrhagic cysts, while rare, were occasionally reported. Their etiology was still undetermined. Trauma probably plays a part and changes in the vessel walls with rupture probably do the rest.

**Uterovaginal Prolapse.**—Mr. Thacher reported two cases. The first was an acute one complicating labor in a bitch. The vagina and cervix were prolapsed, the bladder was out of the pelvis, there was inability to urinate, and the animal was in bad condition. A uterus containing nine pups was removed and the prolapsus reduced. Death occurred in fifteen hours, hydronephrosis and localized peritonitis being present. In the second case an irreducible mass protruded from the vulva and two operations were required to correct the condition. Obstetrical complications were said to be common in animals, and death often occurred without delivery. Acute prolapse was most frequent in the herbivorous animals and the immediate cause was often a very full uterus.

**Inguinal Hernia in the Dog.**—These cases were reported by Mr. Beall. The first patient showed an irreducible inguinal hernia with cystocele, and the

radical hernia operation was done. Death occurred on the second day, the dog showing ulcers of the stomach and an atrophied right kidney. The second patient had a bilateral inguinal hernia. The two sides were operated on separately and complete cure resulted. In the third dog the hernia contained the omentum and the round ligament. Hernia in the dog is a very common condition, the commonest variety being the mid-ventral. The inguinal form occurs much more often in the female than in the male—due probably to the occurrence of pregnancy and to the fact that normally a bitch has practically a patent canal of Nuck. In the male, too, the tunica vaginalis retains its connection with the peritoneum, so that the anatomical facts alone do not explain the occurrence of inguinal hernia which is relatively rare in male dogs.

**Canine Tumors.**—This series was reported by Mr. Ortschild. The first was an adeno-carcinoma of the breast with glandular metastasis. The complete operation was done. Death occurred from cancrum oris. Mixed teratomata over the breast and thorax were found in the second case. These on section showed cartilage, adeno-carcinoma, carcinoma simplex and bone. In another dog a cyst adenoma of the breast was found and removed. This patient died from a phagedenic ulcer of the mouth. In a fourth case a mixed tumor of the breast, which had succeeded to a "milk-breast" following a bite, was removed. Cure resulted. An intracystic papilloma of the breast with metastases, a fibrolipoma of the vaginal wall and a hygroma of the right shoulder were also reported. The last tumor of the series was a pedunculated growth arising from the lower abdomen and just swinging clear of the ground when the dog walked. It was removed, and proved on section to be an adenoma. Tumors—particularly carcinomata of the skin and mammae—are common in dogs. Fibromat, enchondromata and sarcomata of the breast are also seen. Dr. Bloodgood showed the specimen of a melanosarcoma of the liver occurring in a horse.

*Meeting held April 31, 1905.*

**Analysis of 221 Cases of Typhoid Fever.**—This series was reported by Dr. Thompson, of Worcester, Mass. The epidemic had started among workmen in one of the suburbs of Boston, and was traced definitely to a privy infection. The cases were treated at the Boston City Hospital. The majority were males and ranged in age from eight to sixty-three years. Sixty-five per cent. were in the first three decades of life and 5 per cent. gave a history of previous attack. A motley array of symptoms was seen at the onset; deafness was initial in three cases. The febrile period varied from 7 to 86 days and relapses occurred in 21 cases. Rose spots were present in 69 per cent., sweats were a striking feature in two cases, and herpes was noted in one case; 23½ per cent. showed a subnormal leucocyte count. Myocarditis was marked in two cases, thrombosis was seen in seven, infarct of the lung in one and parotitis in two. Nausea and vomiting were troublesome in five. Hemorrhage occurred in 22 patients, distention was marked in 23 and in two cases fatal perforation occurred. The spleen was palpable in 69 per cent. of the cases noted. True catarrhal jaundice was present in one case. Four showed epistaxis, three pleurisy and seven bronchitis. The ear was most often affected of the organs of special sense. Retention of the urine occurred in six cases, acute nephritis in two. Cystitis was seen three times, hematuria twice. Two patients showed acute mastitis. One patient went to term normally during the disease and was delivered without event. Necrosis

of the nasal septum was seen once. The Widal reaction was positive in 93 per cent. of the cases noted. The mortality of the series was 12 per cent. The features exhibited by the cases were the frequency of a typical typhoid state, the notable implication of the central nervous system and the inefficiency of sponging as compared with treatment by tubs.

**Painful Heels.**—Dr. Baer reported five cases of this condition. The first was a man of eighteen who had had gonorrhoeal urethritis three months previously and whose discharge was still present on admission. Both heels were extremely painful, no flatfoot was present and the radiograph showed exostoses beneath the os calcis on both sides. They were both removed by operation and cure was complete. The second patient complained of pain in heels and ankles. There was history of an attack of gonorrhea nine months previously. The os calcis was found thickened, but the patient refused operation. In the third case there was pain in the heels and back. The patient had had three attacks of gonorrhea. There was a spot of extreme point tenderness at the attachment of the plantar fascia. The exostoses were removed by operation and, though cultures were negative, the sections showed diplococci which decolorized by Gram. The fourth patient denied gonorrhea but had had an inguinal bubo. Pain in the heels had been present for several months. There was tenderness on pressure over the heel and on stretching the plantar fascia. The radiograph showed exostoses. These were removed and a pure culture of the gonococcus grown from them. In the fifth patient exostoses were removed but were sterile on culture. Operation, however, gave complete relief.

The primary seat of the deposit in these cases seemed to be in the plantar fascia from which there was a downgrowth into the periosteum. The exostosis was always situated at the attachment of the plantar fascia, but in some of the cases there was also thickening of the sides of the os calcis. Motions were not limited, but there was a characteristic gait, the heels being used little or not at all. When the spine was affected the symptoms were those of an osteoarthritis. In the two cases in this series in which the spine was affected as well as the heels, gonococci were found in the growths removed from the heels.

**Atheromatous Cyst of the Scrotum.**—This case was reported by Dr. Churchman. The patient was a colored man aged forty-one years. The tumor had been present since early boyhood. It lay in the raphe of the scrotum, was freely movable under the skin and was a little larger than the testicles, though resembling them in shape, it had no definite pedicle. There were no symptoms accompanying it. The tumor was removed under cocaine, and proved on section to be an epithelial-lined cyst containing cholesterol crystals and epithelial cells, but no true dermoid elements.

**Bladder Calculus in an Infant.**—The patient, reported by Dr. Churchman, was a male nineteen months of age. He was healthy and sturdy, but had had for four months hematuria with straining and pain at stool and on micturition. By means of a small search a stone was located in the bladder. The patient had not yet been subjected to operation. No case of stone in the bladder in so young a patient had occurred in the 80 cases seen at the Johns Hopkins Hospital.

**Congenital Urethral Stricture.**—This patient was a boy aged thirteen years who had come to the clinic complaining of hematuria and pain over the ureter, with nausea and vomiting. Previous genito-urinary trouble was denied. An X-ray picture and examina-

tion of the urine for tubercle bacilli were negative. Examination of the urethra showed a pin-point meatus and two narrowings—one in the bulbo-membranous portion and one just back of the meatus. Under gradual dilation all symptoms disappeared and the urine became absolutely clear.

**Traumatic Atrophy of the Testicle.**—The patient was aged nineteen years and had been normal in every way until eleven months before admission, when he had received a kick upon the scrotum followed by redness and swelling of the left testicle. The swelling soon went down and atrophy supervened, the testicle gradually shrinking until it reached the size of a hazelnut. It, with an accompanying varicocele, was removed under cocaine. Section of the testicle showed a good many normal tubules and a few atrophied ones. There was no connective-tissue increase. The vas and epididymis were patent and no good pathological explanation was found for the atrophy. The specimen also contained a curious gland-like structure which looked on cross-section much like the uterus. It was connected with the tunica albuginea by a tube lined by columnar ciliated epithelium which looked a good deal like the Fallopian tube. The structures were thought to be rests of the Müllerian duct.

#### NEW YORK ACADEMY OF MEDICINE.

##### SECTION ON GENITO-URINARY DISEASES.

*Stated Meeting, held May 17, 1905.*

The President, Ramon Guiteras, M.D., in the Chair.

**Multiple Vesical Calculi.**—Dr. John Van der Poel reported a case illustrating the advisability of preliminary X-ray plates in cases of enlarged prostate, combined with vesical calculi, when the perineal route for prostatectomy has been decided upon. In the case in question, two stones were detected with the searcher, whereas upon cystoscopic examination with the No. 1 Nitze cystoscope, but one was seen, the second evidently lying in the bas-fond of the bladder. After the prostate had been removed, the two stones were easily taken out through the perineal wound and dilated posterior, urethra, and the bladder explored with the finger as thoroughly as possible. The perineal wound healed up rapidly—(the inverted incision having been used)—and by the seventh day, all urine was passed per urethram, the patient having been up from the fourth day. A persistent cystitis, with pain at the glans penis and the anus, led to a further examination with the stone searcher, when another calculus was easily detected. As the patient had so recently been subjected to a rather thorough and severe perineal operation, litholapaxy was decided upon, in preference to a suprapubic operation. The crushing was done without anesthetic, with the assistance of Dr. Gardner. No pain was complained of except during the process of aspiration, when the parts in the region of the internal sphincter and from where the prostate had been removed, were sensitive, though not exquisitely so. After drainage for two days by a fixed urethral catheter, the patient was up on the third day and out of the hospital on the fourth.

**A Case of Exstrophy of the Bladder.**—Presented by the Chairman, Dr. Ramon Guiteras: The patient, a young man, was shown to illustrate the result of an operation for complete exstrophy of the bladder, the entire bladder having lain exposed on the abdominal wall. The Wood operation was done by Dr.

Guiteras, taking a flap from above the bladder and one on either side from the groins, and bringing them together. The edges of the gaping urethra were then brought together, and healed without any trouble. A few skin grafts were applied about the edges of the wound. Two small sinuses remained, which healed in the course of a few days without treatment. The entire operation was done at one sitting. The result was very satisfactory, considering the nature and extent of the defect. The patient was now able to hold seven ounces of urine in his bladder, and was fairly comfortable, whereas before the operation there was a constant flow of urine.

Dr. Eugene Fuller said he had never before seen such a good result in so aggravated a case.

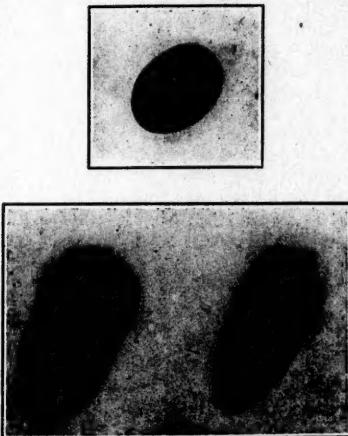
**A New Genito-urinary Basin.**—Dr. A. L. Wolbarst showed a basin especially designed to fit between the thighs. It was made with an anterior notch in which the penis rests. On account of its shape, it is much more convenient than the ordinary pus basin for the purpose of bladder irrigation or other manipulations about the bladder and scrotum.

**Foreign Body Removed from the Bladder.**—Dr. Van der Poel showed this specimen. It was a French nail, two and three-quarter inches long with a very sharp point, which he had removed from the bladder of a man forty-eight years old, who had introduced it into his urethra for the purpose, as he said, of relieving an itching of the parts. While he was engaged in this act, the door suddenly opened, and the nail slipped from his grasp. He consulted Dr. George E. Close, who, detected the nail in the urethra, and the patient was then referred to Dr. Van der Poel, who found that the nail had passed into the bladder. It was readily detected with the stone searcher, with the cystoscope and found to lie almost perpendicularly, with the point downward in the postprostatic pouch—(the nail having been introduced head first)—and the head in the vault of the bladder. On account of its size and its peculiar position, it was deemed advisable to remove it through a suprapubic incision, which was done, and the man made an uneventful recovery. The case is interesting first, from the fact that foreign bodies of over two, or two and one-half inches in length, always, or most always, assume a transverse or transverse-oblique position in the bladder, whereas this was almost parallel with the long axis of the body, and secondly from the fact that although it was very sharp, it gave rise to no pain, strangury, or hematuria.

**Vesical Calculus Removed by Operative Cystoscope.**—Specimen was shown by Dr. Van der Poel. The patient was a man sixty-four years old who had given symptoms of stone in the bladder. With the cystoscope, three calculi, about the size of the tip of the little finger, were detected in the postprostatic pouch. At first the patient refused operative interference, but after the use of diluents had proved unsuccessful, he again applied for relief. The first stone, weighing nineteen grains, was removed with comparative ease with Nitze's operative cystoscope, with the lithotrite attachment. The second stone, weighing thirty-one grains, proved more troublesome. After the cystoscope had been introduced into the bladder the lithotrite attachment opened and the stone seized, the lamp failed to approximate with the rest of the instrument, which could not be withdrawn farther than the bulb. A perineal section was rapidly done under cocaine, the lithotrite closed and withdrawn, and the calculus re-

moved. The patient still had the third stone in his bladder, which Dr. Van der Poel said he hoped to remove in the near future, as it was about of the same size as the others.

Three attempts were made to get a skiagraph of the vesical calculi in this case, but they all proved unsuccessful, owing probably to the thickness of the antero-posterior diameter of the body of the patient, for although not a stout man, he was very large from the pubis to the sacrum. The stones were not composed of pure uric acid, which on account of their composition would fail to show a radiographic shadow, but were apparently made up of phosphates, with carbonate of lime and urates, as no trouble had been found in radiographing them through the shoulder of the patient after their removal from the bladder, their formation being shown on the plate below, which was taken without any intervening substance and the calculi not having been cut.



Dr. Fuller recalled a case of prostatectomy, with stone, that came under his observation some time ago. The patient was about five feet, six inches tall, and weighed fully two hundred and forty pounds. On account of his size he had been unable to walk about for a long time, and his tissues had become so soft that it was difficult to distinguish between fat and muscle. He had an enlarged prostate, and twelve faceted stones in the postprostatic cul-de-sac. The bladder was extremely sacculent, and on account of its size it was considered wise to do the prostatectomy by the perineal route. After enucleating the prostate, five of the stones were removed with considerable difficulty. Ten days later, when the tube was removed, it was found that the enlarged bladder had contracted to such an extent that the remaining calculi could be scooped out with the greatest ease.

**Different Conditions in Movable Kidney and Their Treatment.**—Dr. Robert T. Morris said he would present the subject very briefly. In regard to nomenclature, he believed that the term "loose kidney" was better than "movable kidney," and it was both brief and expressive. In dealing with this condition, there were two chief classifications: First—The loose kidney occurring alone as a diagnostic entity; not associated with other loose viscera. Second—The loose kidney associated with other loose viscera. Going back to the first class, in

which the loose kidney occurred alone, we could again make a division of the cases into those in which the condition of the kidney caused symptoms, and those in which it did not cause symptoms. In a certain proportion of cases of loose kidney, the patients complained very little of any disturbance. Dr. Morris said he had seen kidneys so loose that they could be carried pretty well down to the pelvic brim, and yet the disturbance was not great in degree, while in other cases a range of a few centimetres would provoke most distressing symptoms, even precipitating a psychosis. The causes for the symptoms depended upon three chief factors. When there is an angulation of the ureter it produces obstruction, at times transitory in character, spasm of the muscularis of the ureter, and symptoms similar to those attending the passage of a renal calculus. The second group, and by far the largest, was that in which there was interference with a portion of the large sympathetic nerve branches, which were so abundantly distributed in the kidney, and readily observed in operations on that organ. The dragging on these sympathetic branches, so near to the great solar plexus, provoked the largest number of symptoms. In the third class of cases, we had direct pressure effects; direct mechanical effects. The loose kidney might lie upon the pylorus. When it rested against the pylorus or the duodenum, it might cause obstruction and eventually lead to dilatation of the stomach or give rise to a chronic gastritis. Or pressure in that region might occasion acute attacks of gastrio-duodenitis. Then again, the loose kidney might rest on the superior mesenteric vein. Edebohl has called attention to that possibility, and his observation was apparently borne out in cases of congestion of the cecum and appendix. This congestion might persist for months or years, and some of those patients eventually came to the surgeon for relief. In one patient who came under the speaker's observation in whom the "sweet-oil treatment" had given temporary relief, the symptoms were permanently relieved by anchoring the loose kidney.

Dr. Morris said that in the class of cases in which the loose kidney was associated with other loose organs, we had really to deal with a diastasis of the rectus muscles of the abdomen. These muscles could be separated for a distance of several centimeters with the finger through the skin, and they often remained separated year after year, so that the lax peritoneal support of the viscera, associated with the diastasis, allowed the chain of events which were so frequently observed.

**Treatment.**—In cases in which there was angulation of the ureter as the chief symptom, any one of the common abdominal supports would often afford relief. In those cases in which there was direct pressure upon the pylorus or duodenum, or upon the superior mesenteric vein, one of the common abdominal supports would often relieve the symptoms, and the patients would frequently gain so rapidly in weight and feel so much better that they would refuse to consider operative interference. In the class of cases in which the loose kidney dragged upon the branches of the sympathetic nerve, there were usually many reflex symptoms, and these hypersensitive patients, as a rule, were not well relieved by any form of abdominal support, and for that reason the speaker said he advised operation pretty promptly. He advised operation in cases that were not easily

relieved by support, which was in the majority of this type of cases.

**Choice of Operation.**—Dr. Morris said he formerly employed Senn's method, packing the kidney with iodoform gauze until granulations had appeared; then removing the gauze and trusting to fibrous adhesions. This method worked very well, but left an open wound for a longer period than he liked, and required more time for healing. He then tried the Guyon method, simply suturing without splitting the capsule of the kidney. After that, for three or four years, he tried a method of his own, turning up a trap-door section of the capsule of the kidney and drawing it through the psoas muscle. Later he took up Edebohl's method and employed it in a series of cases with excellent results, and he regarded it as the best operation that had thus far been devised up to the time of the publication of Dr. A. H. Goelet's paper, about two years ago, in which he advised suspension of the kidney by means of a suture introduced in such a way that traction upon it carried the kidney up behind the ribs. This procedure was very simple, so that the operation could often be completed in fifteen minutes or even less and it answered every purpose of retaining the kidney in a normal position. In that class of cases in which there was a wide diastasis of the recti muscles, and in which the loose kidney was associated with other loose abdominal organs, Dr. Morris considered it important to repair the diastasis. To do this effectually, he excised the entire strip of bare fibrous tissue between the recti muscles, and then united the muscles, cutting through peritoneum and all. Sometimes this excised strip was five, six or seven inches long, and two or three inches wide. He then shortened the falciform ligament of the liver, and lessened the tension upon the gastrocolic ligament. After that had been done, the kidney itself could be treated in the manner described by Dr. Goelet.

**The Different Conditions in Calculous Kidney and Their Treatment.**—Dr. Eugene Fuller stated that in dealing with this condition it was necessary to determine whether the stone was encysted or non-encysted. The latter class gave rise to the most trouble, as the former never caused obstructive symptoms. In a case of encysted calculus without any infection, the patient might go on for years without knowing that he had a stone, but a loose stone in the kidney was very apt to give rise to trouble in a comparatively short time. When obstruction and infection had once occurred, disorganization of the kidney was likely to follow, with the formation of a renal or perirenal abscess.

**Symptoms.**—In a case of calculus of the kidney, all the classical symptoms of that condition might be present, or they might be entirely absent. There might be localized pain in the loin, or radiating to the neck of the bladder or the thigh and penis. The pain associated with this condition was often mistaken for an ordinary bowel colic. There might be frequency of urination, or retentive symptoms, or absolute anuria. Hematuria was not an infrequent symptom of the condition, especially in dealing with uric acid calculi. Among the more recent aids in the diagnosis of calculous conditions of the kidney, Dr. Fuller mentioned ureteral catheterization, the use of wax-tipped ureteral bougies, and skigraphy.

**Treatment.**—The choice of treatment lay between the expectant or therapeutic, and the operative. Certain patients of advanced age, with marked evidences

of arteriosclerosis, or other contra-indications to operation, might be treated expectantly. In cases of renal calculus followed by destructive pyelitis, the kidney might be found in such a disorganized condition that its removal was indicated, but entire removal should only be done when it was absolutely imperative, because in such cases the stone diathesis still existed, and the opposite kidney was likely to become similarly involved sooner or later. Nephrotomy or partial nephrectomy in connection with the removal of stones were recommended.

**The Different Conditions in Tuberculous Kidney and Their Treatment.**—By Dr. Charles Langdon Gibson. (To appear in a future issue of the MEDICAL NEWS.) Dr. J. A. Nydegger, of the Marine Hospital, Stapleton, Staten Island, referred to a case of tuberculosis of the kidney under his care at the present time. The patient was brought to the hospital last December, having come from the South, where he had been treated for cystitis. Tubercle bacilli were found in the urine, and subsequently the patient developed chills, followed by high temperature. A cystoscopic examination of the bladder revealed many ulcerations, which were treated locally with a solution of silver nitrate and an emulsion of iodoform. Later, a perineal section was done and the bladder drained, but as the patient failed to improve, it was decided to remove the affected left kidney. Upon cutting down on that side, the upper portion of the kidney was found to be occupied by a large abscess, while the lower section of the organ, as far as could be ascertained, had been entirely destroyed.

Dr. Van der Poel said he had been particularly interested in what Dr. Gibson said in regard to the possibility of doing a resection of the kidney in tuberculosis of that organ. If we could successfully resect a certain amount of diseased kidney tissue, it would certainly be a great advance in renal surgery. In the diagnosis of tuberculous kidney, there were some cases that gave rise to but few symptoms where a diagnosis was difficult. In cases in which there was marked acidity of the urine, with polyuria and pus, the diagnosis of tuberculosis of the kidney was fairly certain, even without the presence of tubercle in the urine, which were only found in about 50 per cent. of the cases, probably because but a single examination from a small specimen had been made. The speaker said he recently saw a patient in whom the symptoms were characteristic of stone, though in a moderate degree. There had been attacks of a dull pain over the kidney, which had persisted for a number of weeks at a time; there had been one or two attacks of hematuria, and pus had been intermittently continuous in the urine. The pain, however, was referred to the left loin, and all the symptoms were attributed to the corresponding kidney. Purely by accident, the right ureter was catheterized before the left, and pus was withdrawn. The patient was so sensitive that the opposite ureter was not catheterized. A radiograph was then taken, which showed a stone in the right kidney. The case was still under observation, and was a good illustration of the problems that were occasionally met with in dealing with lesions of the kidney. When the tubercle bacilli were found, the question becomes comparatively simple, and when we have to deal with occasional attacks of hematuria and pain, with pus in the urine, and with a negative skigraph, it was sometimes impossible to assert whether we were dealing with tuberculosis or a stone in the kidney.

Dr. Robert T. Morris said the idea of removing the affected part of a tuberculous kidney and then depending on constitutional treatment was a new one to him. In selected cases, where the parenchyma only was involved, he thought the method could be resorted to advantageously. There could be no doubt of the fact that in certain cases of tuberculosis of the kidney the constitutional treatment was of the utmost importance.

Dr. Charles H. Chetwood said great advances had been made in kidney surgery during the past ten years, with a corresponding diminution in the operative mortality. The most important advance in connection with this class of diseases was the earlier and more accurate diagnosis. Cystoscopy, cytoscopy and the X-rays were valuable adjuncts to the older methods of diagnosis, and we could now determine not only whether a lesion of the kidney actually existed, but also ascertain the condition of the opposite kidney. By means of the X-rays, the presence or absence of renal calculi could be determined in cases where the diagnosis could not possibly have been established by other methods, and it was even claimed that tuberculosis of the kidney could be recognized by means of the rays. In dealing with a calculous kidney, the occurrence of infection would often be the determining factor in bringing the case to the attention of the surgeon, even when multiple stones were present. In operating for the relief of pyelonephrosis, with or without the presence of stone, it was often difficult to decide whether to remove the kidney or not. The general conservative opinion was to save as much of the kidney as possible. Even when nothing was left, apparently, but a mere fibrous sac, the organ might still possess some functioning power. The same conservatism was not advisable in dealing with a tuberculous kidney, according to the consensus of opinion among writers on that subject. The operation of resection of the kidney had thus far shown a high mortality, and where the integrity of the opposite kidney could be established, a complete nephrectomy would probably be preferable.

Dr. Chetwood said he did not believe we had to deal with primary tuberculosis of the bladder. Given a tuberculosis of the bladder, we might expect to find tuberculous lesions elsewhere, usually in the kidney.

**Gonorrhreal Infection of the Kidney.**—Dr. Follen Cabot reported the case of a young man who had a stone in the bladder, which was finally removed. The patient enjoyed good health for about a year, when pus was found in his urine, and he was treated for a time for cystitis. He was subsequently examined with the cystoscope, and pus was observed coming from the kidney. A catheter was introduced into the pelvis of that kidney, and the pus that was withdrawn was found to contain many gonococci. The man had had a previous attack of gonorrhea, for which he claimed that he had received no local treatment whatever. The urine continued to show pus, and a subsequent nephrotomy revealed six calculi in the kidney, none of them loose. The kidney also contained about a pint of pus, from which unfortunately no cultures were made. A few days after the operation the attempt was made, but with negative results, perhaps owing to the fact of the presence of many kinds of micro-organisms. The pus drawn from the kidney pelvis by ureteral catheter showed typical gonococci by Gram's decolorization stain but no cultures were made at that time.

Dr. A. H. Goelet differed with Dr. Morris on the subject of nomenclature. He did not favor either the term movable kidney or loose kidney, because the normal kidney was movable. He employed instead the term prolapsed kidney, which described the condition more accurately than any other that had been suggested.

In speaking of the conditions caused by prolapsed kidney, Dr. Morris stated that it produced a congestion of the appendix and the adjacent bowel, but he did not call attention to the fact that it interfered with the function and nutrition of the kidney itself, producing a condition which might be only an irritation of the kidney at first, but which in many instances went on to a mild form of pyelonephritis. The occurrence of this condition he thought depended a good deal upon the actual position of the kidney, and the habits of dress of the patient. He had shown that pyelonephritis exists in the majority of these cases as demonstrated by microscopical examination of the urine. Another pathological condition produced by prolapse of the kidney was a chronic congestion of the pelvic organs in the female, owing to interference with the return circulation from the pelvis. Because women wore their clothing suspended from the waist distention of the bowels must take place below the waist line, and in this way the kidney which is attached to the colon and driven back against the ovarian vein, pinching it against the spine, and thus producing pelvic congestion. The question of the attachment of the kidney to the colon had not received sufficient attention, and was an important factor in these cases.

**Operation Upon a Prolapsed Kidney.**—In operating for prolapsed kidney, Dr. Goelet said he had returned to the method of packing gauze around the lower pole of the kidney, in addition to the sutures, the packing being inserted for the purpose of preventing reattachment of the kidney to the colon and to lessen the strain on the sustaining sutures. He emphasized the importance of completely detaching the kidney from the colon as one of the essentials of the technic of the operation. Dr. Goelet expressed his appreciation of Dr. Morris' commendation of his method of suturing the kidney, which unquestionably restores the organ to its normal position, and he believed restoration of the kidney to its normal position was essential in successfully overcoming the symptoms and conditions produced by displacement.

Dr. Guiteras said that in some cases where stone was present in one kidney with pain on the opposite side, the pain was not renorenal reflex, but an evidence of acute inflammation of the kidney on the painful side, while on the side, where no pain was complained of, there had been an inflammation that had left the kidney in a much worse condition than its fellow, in which pain was present. At the last meeting of the Section, Dr. Guiteras said, he had shown two kidneys from the same patient, one removed at operation, the other at autopsy. In that case the patient had complained only of pain on the right side, never on the left. Upon catheterization of the left ureter, there was an escape of two ounces of pus, while there was a very slight amount of pus from the right kidney. The left kidney was removed and was found to be in a condition of pyonephrosis—a pus sac with thin walls and the kidney tissue practically destroyed. The patient died two days after the operation, and at the autopsy the right kidney was found to be in a condition of acute suppurative

pyelonephritis. Dr. Guiteras said that the case reported by Dr. Cabot, in which gonococci were found in the kidney, was an extremely rare one. There were probably not over a dozen cases of gonorrhreal infection of the kidney reported in literature.

Dr. Van der Poel remarked that the experiments with artificial tuberculosis in rabbits detailed by Dr. Morris were very interesting and instructive, as regards the natural repair of tissues affected with tuberculosis, although it was impossible to say how close the analogy was between human tuberculosis and the disease in rabbits.

**General Enteroptosis.**—Dr. A. Ernest Gallant makes use of the term "ectopic" as embracing the various forms of kidneys which are not found to occupy their normal relation in the loins and gives preference to the term "prolapsed" kidney to that variety which has descended behind the colon, and which is almost always associated with prolapse of the other abdominal viscera. The latter condition is frequently overlooked by those surgeons who deem every prolapsed kidney a subject for fixation, forgetting that the kidney mobility is only a part of the general enteroptosis, involving, not infrequently the stomach, colon, liver, spleen, etc. Occasionally, following inquiry, the kidney will be found prolapsed—traumatic movable kidney, but, if the surgeons who fail to examine the stomach, would send their patients to a stomach specialist and ask for his report on the position, size, shape and working capacity of that organ, many unnecessary operations on prolapsed kidneys would be avoided. Prolapsed kidney is, unfortunately, easy of palpation, so easily reached that it offers a tempting field for surgical reward. In dealing with a prolapsed but replaceable kidney, Dr. Gallant said that he seldom finds it necessary to operate. A replaceable kidney as well as other intra-abdominal viscera, with the exception of a floating spleen, can be kept in place by means of a properly fitted corset, such as he describes on a previous occasion. If, as has been conclusively shown, that ordinary palpation of the kidney does produce albumin in the urine, what must result when the kidney has been fixed and subjected to the constant irritation and pressure induced by the corsets and clothing usually worn? Dr. Gallant said that he could not agree with Dr. Morris' statement that a diastasis of the recti muscles is present in the majority of these patients, unless he would limit it to women who have borne children or had large abdominal tumors, and others who are very stout. In Dr. Gallant's experience in sixty per cent. of women with prolapsed kidney there was no history of childbearing or tumors, and the abdominal muscles were very tense. In cases where actual diastasis existed, instead of taking out a strip of fascia from between the recti, as suggested by Dr. Morris, Dr. Gallant prefers to reinforce and reduce the abdominal wall by overlapping the fascial layers, as suggested by Dr. J. A. Blake for the cure of ventral hernia.

Dr. Morris, in closing, said that the term loose kidney was briefer than prolapsed kidney, and more euphonious than ectopic kidney. While many patients were greatly relieved by a properly fitted corset, still, it did not relieve all. Furthermore, the fashions in corsets changed, and the women sometimes tired of the same style, and asked for operation and permanent relief.

Dr. Fuller, in closing, said he did not feel very hopeful regarding the outlook of partial nephrec-

tomy in case of tuberculosis of the kidney. The disease was so diffuse in its nature that hygienic and climatic influences offered greater chances of a permanent cure than an operation of the kind described. Of course, in cases where there was an abscess of the kidney, operative interference was imperative.

## BOOK REVIEWS.

**DISEASES OF THE HEART**, a Clinical Text-book for the use of Students and Practitioners of Medicine. By EDMUND HENRY COLBECK, B.A., M.D., B.C. (Cantab); F.R.C.P. (London); D.P.H. (Cantab), Physician to Out-Patients at the City of London Hospital for Diseases of the Chest; Physician to the Metropolitan Dispensary, E.C.; Late House Physician at St. Mary's Hospital, etc., etc. With 43 illustrations. Second Edition, revised and enlarged. W. T. Keener & Co., Chicago.

THIS is an excellent monograph on the diseases of the heart. It is especially full in the matter of diagnosis, but no one who realises the difficulties of cardiac therapeutics will complain of lack of treatment in it. Over sixty pages of its 340 are devoted to diseases of the myocardium. This is as it should be, for as has been well said, it is not so much the valvular lesions that are serious in the heart, since these may be compensated for by the heart muscle, but when the muscle begins to fail, then the end is not far off. This is the second edition, and in these days, when monographs in medicine are no more popular than collections of short stories, in general literature it is interesting to note that it is called for only three years after the first. It contains an account of the mechanical strain of the heart and of the Stokes-Adams syndrome, which were not in the work as originally published. We can cordially recommend this little volume to those who are especially interested in the diseases of the heart.

**THE OPHTHALMIC YEAR-BOOK**. A Digest of the Literature of Ophthalmology, with Index of Publications for the Year 1903. By EDWARD JACKSON, A.M., M.D., Emeritus Professor of Diseases of the Eye in the Philadelphia Polyclinic; President of the American Academy of Ophthalmology and Oto-Laryngology; Ophthalmologist to the Denver County Hospital, St. Anthony's Hospital, and Mercy Hospital, Denver. The Herrick Book and Stationery Company, Denver, Colo.

FROM the mass of ophthalmological literature published, this author has weeded out that which appeals to him as of relative importance and has critically reproduced it in sufficient detail to make it available for practical application at such places as it is possible to convey more clearly the visual character of the topic under discussion. The text is well illustrated, and where new operative methods are described the different stages are diagrammatically shown.

A second feature of the book is a carefully compiled index of all the original contributions dealing with this subject which have appeared during the foregoing year.

## BOOKS RECEIVED.

**A TREATISE ON PLAGUE**. By W. J. Simpson. 8vo, 466 pages. The University Press, Cambridge.

**ENLARGEMENT OF THE PROSTATE**. By Dr. J. B. Deaver. 8vo, 266 pages. Illustrated. P. Blakiston's Son & Co., Philadelphia.